AMERICAN

Camouflaged Communications Center of American Command Post during heavy fighting

Front Line Telephone Post

TELEPHONE lines are life-lines wherever our men fight. The lines lengthen with every mile of advance.

Bell System manufacturing facilities have had to be devoted almost exclusively to keeping the armed forces supplied with communication and electronic equipment. As a result, we are short of telephones, switchboards and other equipment needed to meet civilian requirements.

We're sorry if you've had to wait for home telephone service. But you can be sure that every effort is being made to take care of your needs just as soon as the war allows.

BELL TELEPHONE SYSTEM

OUR SOLDIERS TELEPHONE OVER HERE, TOO. . . . Whenever you can, please give the service men and women first chance at Long Distance between 7 and 10 each night. They'll appreciate it a lot.

AMERICAN FORESTS

VOLUME 50 OCTOBER, 1944 NUMBER 10

Editor-in-Chief
OVID BUTLER

Editor
ERLE KAUFFMAN

Associate Editor
LILIAN CROMELIN

CONTENTS

Page

CONSERVATION COMMUNIQUES 466

EDITORIALS 471
Postwar Conservation Budgets
Trees for the Wounded

BUFFALO—Wild or Tame?
By Victor H. Cahalane 472

CHECK-LIST FOR SURVIVAL
By Martin Eskay 476

POSTWAR CONSERVATION 479

DUCK HUNTING vs. DUCK SHOOTING
By Frederick C. Lincoln 481

WOOD OF TOMORROW—Pictorial 484

THE ANTHRACITE REGION DISCOVERS ITS "SURFACE"—Part II
By Reginald D. Forbes 486

THE WOODS I KNEW
By Howard J. Shannon 489

SPECIALTY FOREST
By Fred Trenk 492

GEORGE W. NORRIS—Great Leader of Conservation
By Raphael Zon 494

THE CONSERVATION CALENDAR 498

BOOKS AND PUBLICATIONS 510

THE COVER
"Fall Migration"
Photograph by Paul Fair

The Editors are not responsible for loss or injury of manuscripts and photographs while in their possession or in transit. All manuscripts should be accompanied by return postage. The Editors are not responsible for views expressed in signed articles. Notice of change of address for *American Forests* should be received by the tenth of the month preceding issue. Entered as second-class matter at the Postoffice at Washington, D. C., under the Act of March 3, 1879. Acceptable for mailing at special rate of postage provided in Section 1103, Act of October 3, 1917, authorized July 10, 1918. Additional entry at Baltimore, Md., December 29, 1931.

Copyright, 1944, by The American Forestry Association.

American Forests

Published monthly by

THE
AMERICAN FORESTRY
ASSOCIATION

919 Seventeenth Street
Washington 6, D. C.

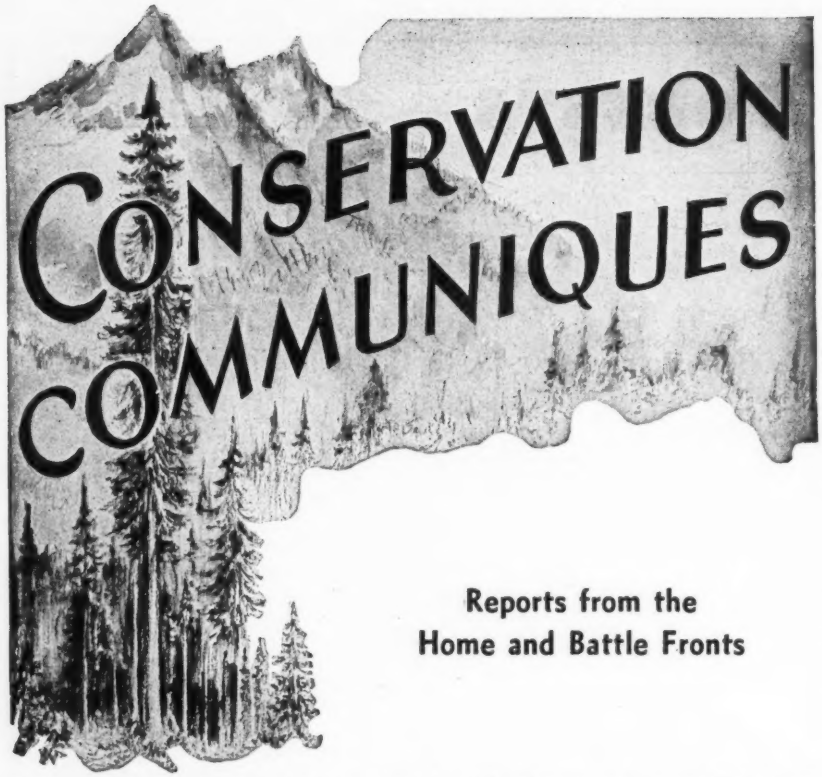
The American Forestry Association, founded in 1875, is a citizens' organization for the advancement of intelligent management and use of the country's forests and related resources of soil, water, wildlife and outdoor recreation.

Its educational activities seek to bring about a better appreciation and handling of these resources, whether publicly or privately owned, that they may contribute permanently to the welfare of the nation and its people.

In addition to publication of its magazine—AMERICAN FORESTS—designed to keep before the people of the country important conservation questions and issues, the Association carries on educational work in various fields including forest fire prevention, reforestation, protection of wildlife, prevention of soil erosion, preservation of wilderness areas, establishment of national forests and parks, advancement of forestry by private endeavor, the teaching of conservation in schools and the promotion of research in timber growing and forest utilization.

The Association is independent and non-commercial, and has no connection with any federal or state governments. Its resources and income are devoted to the advancement of conservation in the interests of public welfare, and all citizens are welcomed to membership.

35c A COPY
$4.00 A YEAR



Reports from the Home and Battle Fronts

The employment situation in the lumber, pulpwood and basic timber products industries remains acute. The War Manpower Commission has announced that employment during the first half of 1944 was the lowest since January, 1942. In May, employment was 54,400 below May, 1943. Among the factors accounting for this decline is a shift of workers back to the farm and unfavorable logging weather, particularly in the South.

• • • •

Furs were reportedly so scarce in Denmark toward the end of 1943 that rat skins were used for lining women's coats.

• • • •

Discovery of a new process for making paper from bamboo holds promise for the development of an expanded paper industry in the American Republics, according to the Office of the Coordinator of Inter-American Affairs. Experiments by the Herty Foundation in Georgia indicate that high-grade paper suitable for bookbinding, bag and wrapping purposes can be made from bamboo.

• • • •

The Axis press reports the establishment of a system of protected seed trees in German forests, indicating attempts at intensive reforestation resulting from serious overcutting. The new system calls for "Mother trees" specially selected because of soundness and rapid growth that will produce at least a thousand seedlings. An innovation of the system is the selection of seed trees of the poorest type for comparative study.

• • • •

Meanwhile, a European lumber publication reports that cuttings in Danish forests during 1942 and 1943 were sixty-seven percent in excess of normal. Beech forests have been particularly affected. In these forests fellings in three years have been two and a half times the annual increment.

• • • •

Chile has announced a National Forestry Council charged with the development and enforcement of a national forestry policy. A forestry code and a general plan on policy are to be submitted by the Council for official consideration.

• • • •

Reports from Russia indicate widespread conversion of tractors to producer-gas generation. Use of timber as a fuel, however, is discouraged by leading Soviet experts on the grounds that it is relatively low in energy-giving content and is also expensive. One tractor, they point out, consumes annually the wood from one hectare of forest (two and a half acres). Thus the general use of timber for tractor fuel "would ravage too great areas of timber." Charcoal is recommended. Also, good results are said to have been obtained from dry distillation of wood waste.

• • • •

The Office of the Coordinator of Fisheries has announced that, with few exceptions, applications for priorities for the construction of additional fishing vessels will not be approved for the remainder of the year. The reason—construction during the first half of 1944 has been so accelerated that materials have been depleted.

• • • •

Jacob L. Babler, wealthy St. Louis, Missouri, insurance man, long has contended that the state should earmark a one cent tax on each $100 of property to maintain state parks. On August 20, according to the Associated Press, the State Constitutional Convention agreed with him, and wrote the provision into the new constitution. Whereupon, Mr. Babler announced that he would give $2,500,000 to maintain the Babler Park in St. Louis, which he had previously donated.

• • • •

A total of 464 paper mills, board mills, and manufacturers of building paper and board are using waste paper today, according to the WPB. Prewar consumption of waste paper averaged 4,500,000 tons a year, as against 6,000,000 tons in 1943. The goal for 1944 is 8,000,000 tons, sixty-six percent of the available recoverable waste paper supply.

• • • •

Peru has extensive plans for developing the natural resources of the country, including the construction of one of the largest hydroelectric plants in South America. Work already has begun on the great 125,000-kilowatt Canyon del Pato hydroelectric installation on the Santa River, 250 miles north of Lima. Important in this program is an irrigation project to bring water to 250,000 desert acres and, later, industries to utilize this power and refine the minerals which exist in the region.

• • • •

The Army has developed a new tent pole the chief features of which are that its sections are interchangeable, are not hooked together by hinges, sliding sleeves, or other moving parts, and are only half as heavy as the old three-section-jointed job. Made of light-weight woods, the pole GI's pack in the future will weigh but seven and a half pounds.

THE G.I. SHOVEL WITH THE HIGH I.Q.

This Buckeye equipment will save on your post-war jobs!

Buckeye "Centro-lif" Bulldozers and Trailbuilders, Cable Control Units and other Tractor Equipment, Spreaders, Trenchers, Road Wideners, R-B Power Finegraders.

American construction equipment has become a potent weapon; is giving a good account of itself on every front. As always, some pieces of equipment are giving outstanding performance, and the Buckeye Clipper is one of them. The U. S. Army does not endorse any product—plays no favorites—which is fair all around. But men in the service, from our town and elsewhere, former shovel operators and even some of our employees in the service overseas, tell us what a swell job Clippers are doing. We quote:

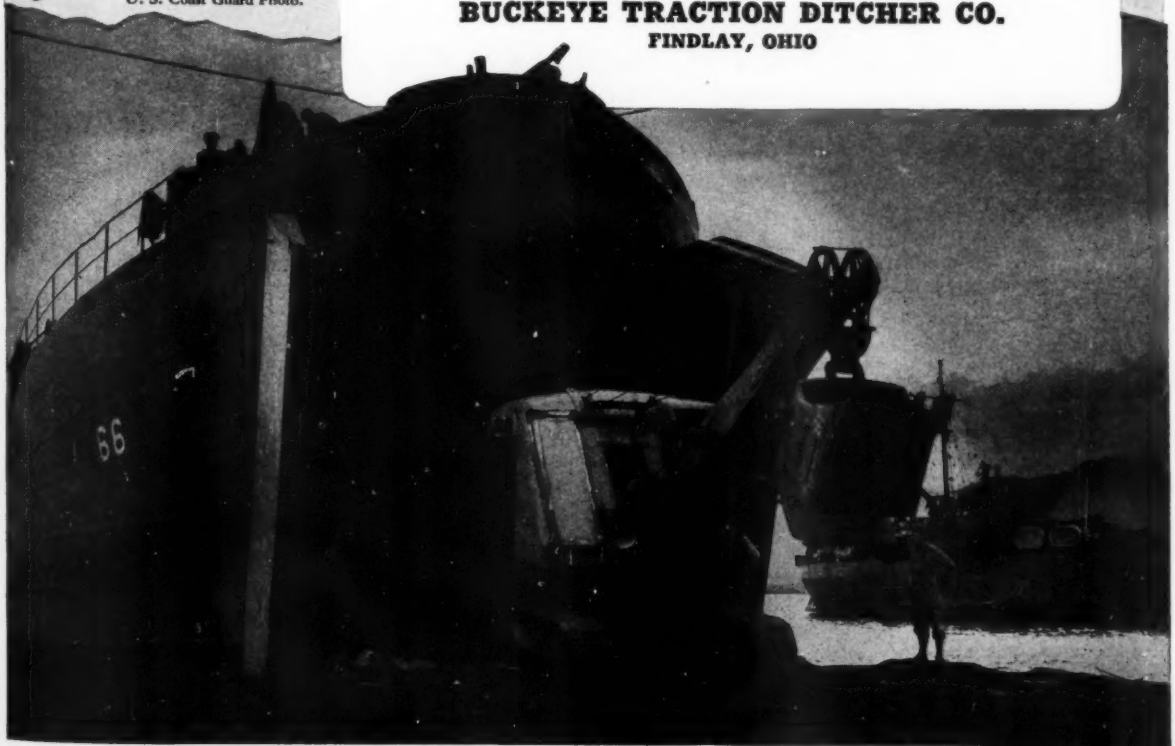
> "You don't need a high I.Q. to run this G.I. shovel—it practically runs itself. Vacuum power control sure makes it easy to handle. It's easy to maintain, too. The guy who designed it sure felt for the 'Joes' on the maintenance end."

Well said, soldier! The trickle of Clipper repair parts going to operational bases bears out that last statement. Clippers are getting more abuse at the "fronts" than they ever got on construction jobs, in clay and gravel pits or in material yards, but they can take it.

We've had to put off a lot of people who wanted Clippers—war comes first. Those who are able to wait will find Clippers worth waiting for.

BUCKEYE TRACTION DITCHER CO.
FINDLAY, OHIO

U. S. Coast Guard Photo.



Buckeye Clippers
CONVERTIBLE SHOVEL—CRANE—TRENCH HOE
MEVAC HYDRAULIC VACUUM POWER

THE FOREST EXCHANGE . . .

Our Thanks

SIR: I have read and reread Mr. Oberholtzer's wonderful article "Hands Across the Border" in the September issue, and your effective and penetrating editorial. As one who has had this region close to his heart for many years, I want to thank you and The American Forestry Association most sincerely for this contribution to the conservation cause.

I cannot express to you how stimulating this work is to one who has possibly become somewhat discouraged during very recent years at the obstructions which have been thrown in the path of this movement.—*F. B. Hubachek*, Chicago.

Friend of the Hemlocks

SIR: I am sure the article "My Friends —the Hemlocks of Crater Lake," by Doris Payne, in the August issue, will attract many readers.

As indicating what the article means, may I say that although I have been visiting Crater Lake often in the course of the past twenty years and have been studying it continuously, and had from time to time made mention of the values of the mountain hemlock, I did not realize until a recent visit how important that tree is in the Crater Lake region. Actually the greater part of the forest on the upper part of the mountain of Crater Lake is mountain hemlock, and it makes a magnificent forest, not only as individual trees, but as a group of trees. So, may I say that Mrs. Payne has not overstated the case.—*Dr. John C. Merriam*, Eugene, Oregon.

Need a Pilot?

SIR: I recently read in your magazine about counting elk from airplanes ("Elk Below," by Orange Olsen, February issue). I am now flying light planes in China and getting valuable experience, and at the conclusion of the war I intend getting a job as a light plane pilot on this sort of work. Any information you can give me as to where I might apply for such a job will be appreciated.—*T/Sgt. Daniel Sprechner*, 19th Liaison Squadron, China.

White Buffaloes

SIR: The article "Montana's Albino Buffalo," by Peyton Moncure, in your September issue, interested me very much as I worked as clerk-stenographer at the Bison Range at Moiese, Montana, about sixteen years ago.

Mr. Moncure mentions that there is a white buffalo in the Alaska herd. It seems to me that there is every possibility that this animal is a close relative of the one at the Moiese Range as the buffalo which are ranging in Alaska are descended from those shipped from the Moiese Range while I was working there. — *Mrs. Elizabeth Guntermann*, Harlem, Montana.

THE AMERICAN FORESTRY ASSOCIATION

919 SEVENTEENTH STREET, N. W., WASHINGTON 6, D. C.

OFFICERS

President
W. S. ROSECRANS

Executive Secretary
OVID BUTLER

Treasurer
I. J. ROBERTS

Business Manager
FRED E. HORNADAY

Vice-Presidents

Thornhill Broome — Illinois, Izaak Walton League of America.

Victor M. Cutter — New Hampshire, Former Chairman, New England Regional Planning Commission.

J. N. Darling—Iowa, Honorary President, National Wildlife Federation.

Col. Arthur P. Fischer — District of Columbia, Advisor, Natural Resources, Philippine Islands.

Mrs. T. M. Francis—Alabama, Chairman of Conservation, General Federation of Women's Clubs.

Mrs. Luis J. Francke — New York, Chairman, Conservation Committee, The Garden Club of America.

John D. Guthrie—Virginia, American Forest Fire Medal Foundation.

Edmund Hayes — Oregon, Chairman, Keep Oregon Green Association.

Paul G. Hoffman — Indiana, Chairman, Committee for Economic Development.

Augustus S. Houghton—Connecticut, New York State Reforestation Commission.

Don P. Johnston — North Carolina, Manufacturer.

Irving K. Larom — Wyoming, President, Dude Ranchers' Association.

Aldo Leopold — Wisconsin, The Wilderness Society.

Glenn L. Martin — Maryland, President, League of Maryland Sportsmen.

Duncan McDuffie — California, President, Sierra Club.

Julian McGowin — Alabama, Chairman, Advisory Board, Department of Conservation.

James G. K. McClure — North Carolina, President, Farmers Federation.

Mrs. George D. Pratt — New York.

Dr. Henry Schmitz — Minnesota, President, The Society of American Foresters.

Harper Sibley — New York, Sibley Farms.

Lowell Thomas — New York, Radio Commentator and Author.

Board of Directors

Goodwin B. Beach, 1944 — Connecticut, President, Connecticut Forest and Park Association.

Louis Bromfield, 1948—Ohio, Friends of the Land.

Bryce C. Browning, 1947 — Ohio, Secretary, Muskingum Watershed Conservancy District.

Frederick P. Champ, 1946 — Utah, Mortgage Bankers Association of America.

Samuel T. Dana, 1947 — Michigan, Dean, School of Forestry and Conservation, University of Michigan.

Karl T. Frederick, 1946 — New York, Chairman of the Board, New York State Conservation Council.

William B. Greeley, 1948 — Washington, West Coast Lumbermen's Association.

Henry P. Kendall, 1945 — Massachusetts, New England Council.

L. F. Livingston, 1944 — Delaware, American Society of Agricultural Engineers.

Walter H. Meyer, 1948—Connecticut, Yale School of Forestry, Yale University.

Frank E. Mullen, 1946 — New York, National Broadcasting Company.

Randolph G. Pack, 1944 — New York, President, Charles Lathrop Pack Forestry Foundation.

John W. Watzek, Jr., 1945 — Illinois, National Lumber Manufacturers Association.

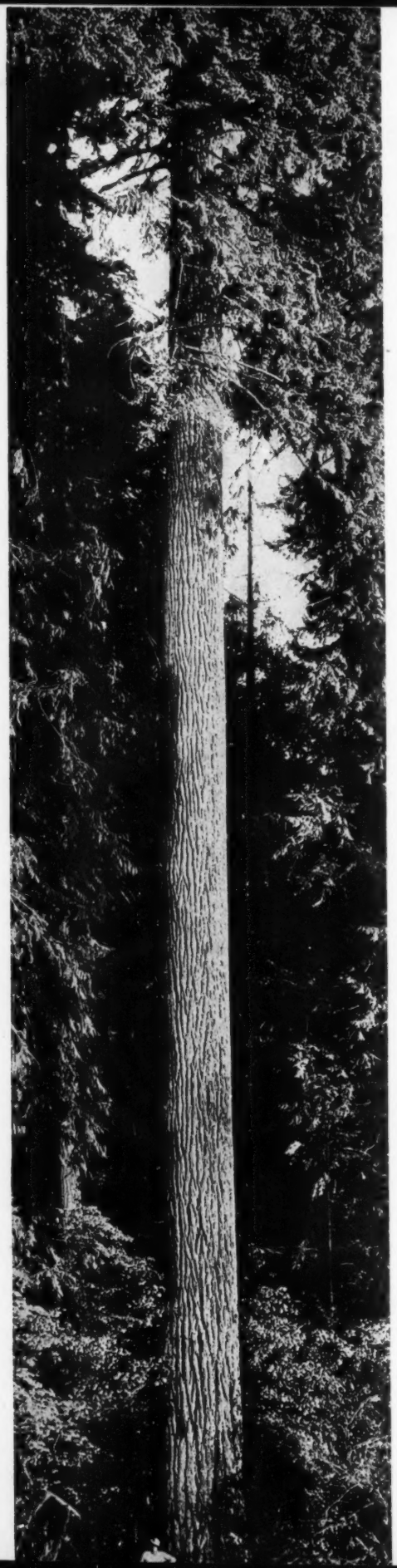
William P. Wharton, 1947 — Massachusetts, President, National Parks Association.

C. P. Wilber, 1945 — New Jersey, Director of Conservation of New Jersey.

Forest Resource Appraisal

JOHN B. WOODS, Director **JOHN C. REDINGTON, Field Secretary**

BEAN
Orchard and Crop
SPRAYERS
Represent 60 Years of Engineering and Manufacturing Leadership!
Since 1884, the name "Bean" has meant the finest in pest control equipment. Today, many thousands of Bean High-Pressure Sprayers are in use in every agricultural area throughout America and in many other parts of the world. The extraordinary designing, manufacturing and engineering "know how" gained through the building of Bean Sprayers and other FMC equipment, made possible the "Water Buffalos," the amazing amphibious tanks fighting with the Army and Navy. New and even better FMC equipment will serve the nation tomorrow.
LAKELAND
RIVERSIDE
HOOPESTON
LOS ANGELES
FOOD MACHINERY CORPORATION
EXECUTIVE OFFICES: SAN JOSE, CALIF.
Bean Sprayers are manufactured by Bean-Cutler Division, San Jose, California and John Bean Mfg. Co. Division, Lansing, Michigan.
Other Typical FMC Products
JOHN BEAN MFG. CO.
Automotive Service Station Equipment, Fog Fire Fighters, Bean Royal Spray Pumps.
Lansing, Michigan.
Anderson-Barngrover Division Complete line of machinery for canning foods. San Jose, Calif.
Texas Division... Food Protective Processes, Fruit & Vegetable Packing Equipment, Canning Machinery. Harlingen, Texas.
Florida Division... Citrus and Vegetable Packing Equipment, and Food Protective Processes. Dunedin and Lakeland, Florida.
Sprague-Sells Division. A complete line of food canning machinery. Hoopeston, Illinois.
Niagara Sprayer & Chemical Co. ... Insecticides for protecting crops from insects and diseases. Middleport, N.Y.; Jacksonville, Fla.; Burlington, Ont., Canada.
Riverside Division. Citrus Packing Equipment, Automatic Box Making & Lidding Machinery, Fruit and Vegetable Protective Processes. Riverside, California.
"Water Buffalo" amphibious tanks. 7 of Food Machinery Corporation's 14 major factories are making "Water Buffalos" or sub-assemblies.
Peerless Pump Division. Deep well turbines, hi-lifts & pumps handling water for every purpose. Los Angeles and Fresno, California; and Canton, Ohio.



A Hundred Trees Like This . . .

The role of the forest in contributing to the economic and social stability of a community, a state, or a region is nowhere more graphically expressed than in the following lines from *A Decade of Progress in Douglas Fir Forestry,* by E. H. McDaniels, published by the Joint Committee on Forest Conservation of the West Coast Lumbermen's Association and the Pacific Northwest Loggers Association:

"The time of eight men for a year goes into the manufacture of 1,000,000 feet of rough Douglas fir lumber (which means fewer than a hundred trees like the one shown at left). The average wage is around $1,500 each. That comes to about $12,000 in salaries and wages.

"Taking all the workers in the lumber industry (Douglas fir region), married and unmarried, the number of dependents averages one and three-tenths per worker. That makes eighteen people directly supported for a year by the manufacture of 1,000,000 feet of lumber.

"To take care of the wants of these eighteen people requires about twelve storekeepers, doctors, filling station attendants, school teachers, policemen, bus drivers and so on, and these people also have dependents. This service group and their families total about twenty-eight. That makes something like forty-five individuals altogether who get their living for a year from the production of 1,000,000 board feet."

Thus, and considering only logging and milling, the 8,700,000,000 board feet of Douglasfir cut in western Washington and Oregon in 1942 made a living for 393,000 people—ten percent of the estimated population of these two states. Add transportation, remanufacture and retail selling and the percentage is greatly increased.

When millions of American boys put aside their weapons of war, the forest will provide many with peacetime employment—lifetime security if we, and they, adhere to a realistic policy of forest conservation.

Photograph by courtesy
of the Consolidated Timber Company of
Portland, Oregon

Editorial

POSTWAR CONSERVATION BUDGETS

SOME light is shed on the trend of governmental thinking on postwar conservation—what form it is to take, how it is to be applied and at what cost to the taxpayer — in the mid-September announcement by the Department of the Interior (see page 479 of this issue) of plans for the lands and bureaus under its jurisdiction. And it is not of the shrinking-violet variety.

For nine bureaus—the General Land Office, the Fish and Wildlife Service, the Grazing Service, the National Park Service, the Bureau of Reclamation, the Office of Indian Affairs, the Bureau of Mines, the Geological Survey and the Bonneville Power Administration — the department outlines a $4,000,000,000 program for development of millions of acres of the public domain. It would provide, if approved, some 2,000,000 man-years of employment for war veterans and dislocated war workers over the reconversion period.

It is not intended here to count unhatched chickens and pass upon the merits of the various projects Interior proposes. The more immediate question is will Congress after the war be in the mood to agree to multi-billion-dollar conservation budgets? If the September 10 recommendations of the House Committee on Postwar Economic Policy and Planning mean anything, a program of tax reduction and other steps to bring about return to a stable peacetime economy is in the making. Specifically, the committee rejected "the theory that government spending in itself can provide a satisfactory stimulus to production and employment."

Even in rosier and less critical days a $3,000,000,000 reclamation program, such as Interior proposes, might well cause the blinking of many congressional eyes. How will the taxpayer, pondering over the bill for global war, react to a grant of $226,000,000 for improving western range lands? How will he feel, under the impact of an estimated yearly postwar tax of $900 for himself and family, to a $21,000,000 annual budget to develop new tourist-attracting facilities in national parks, plus an additional outlay of $11,000,000 for refurbishing the old?

Only the American people, of course, know the answers, and the trend of their thinking seems unmistakable. When Congress gets round to appropriating for postwar it is almost certain that the cry from the grass roots will be to toss out the window any over-ambitious and unrealistic project. And conservation would do well to avoid the stigma of being characterized, either by our lawmakers or taxpayers, as unrealistic.

The cost of victory in terms of resources, particularly our forest resource, has been great—just how great remains to be seen. At the same time, many major long-term conservation programs, built up over the years at high cost to the taxpayers, have been drastically curtailed since Pearl Harbor. Much essential maintenance work, particularly in resource protection and management, has been reduced to a dangerous level. In view of this, if we are to pursue a realistic postwar conservation policy, these basic programs—the rehabilitation of war resource damage, integrated, of course, with human rehabilitation, and the restoration and acceleration of essential programs displaced by war—must come first. Even these, if properly carried forward, will require unprecedented federal appropriations. The grandiose schemes, patterned on the vision of a vast public works program to bridge the employment gap between war and peace, should be held in reserve—to be used if and when.

Boldness—and Interior's program is undeniably bold — is an indispensable asset, but at a time like this it must be harnessed with realism. And realism, applied to postwar conservation, means simply that it is likely to be more profitable, when shaping a program, to keep our sights on what is before us—and not go aiming at the sky.

TREES FOR THE WOUNDED

FROM Forester E. V. Jotter comes an appeal so worthy that we are passing it on to those individuals and organizations searching for ways to do more for our hospitalized servicemen.

"At Fletcher General Hospital," Mr. Jotter writes from Cambridge, Ohio, "and I understand at other Army hospitals, no funds were provided, in accordance with an Army policy, for planting trees and shrubs. The buildings are unprotected from the heat and the sun, and the walks and openings between buildings are equally exposed.

"The convalescent soldiers should get outdoors, but not where they are exposed to intense heat and sunlight. Many have been in the tropics and need especially to be protected from sunlight. Aside from these considerations, the value of trees and shrubs in creating attractive surroundings to help in building up mental and physical wellbeing is generally recognized."

Individuals and organizations can contribute a real service to their wounded fighting men, Mr. Jotter suggests, by providing funds to help supply adequate planting stock for landscaping. "In addition, they can sponsor the planting of small tracts of from one to five or more acres as forest plantations, which would work into the landscape program and inject new interest and beauty. Labor for the planting of these trees could be made available from the patients who have convalesced sufficiently to perform a limited amount of work. Hospital authorities seem agreed that this might be a part of the reconditioning program, and that soldiers would appreciate an opportunity to assist in developing something which would be of permanent value."

Trees can be put to no greater service than this. Nor can individuals, organizations and other groups contribute more to the permanent well-being of their hospitalized fighting men. Why not, then, launch upon such a project in your own locality, working direct with the nearest Army hospital authorities? October is an ideal time for planting!

BUFFALO

Wild or Tame?

By VICTOR H. CAHALANE

WHEN the Union Pacific and other railroads pushed across the plains, their steel bands cut into the grasslands and spelled the doom of the buffalo. Millions had already been shot—killed for their hides, for their meat, or left to rot, with only their tongues taken. Often they were shot merely to relieve the monotony of prairie travel. Professional hunters were hired to kill the remaining millions that thundered across the path of the encroaching railroads. Civilization finished the job.

The railroads advertised special excursion rates: "Ample time will be had for a grand BUFFALO HUNT. Buffaloes are so numerous along the road that they are shot from the cars nearly every day. On our last excursion our party killed twenty buffaloes in a hunt of six hours! Round trip tickets from Leavenworth, only $10!"

The American buffalo was once the most abundant game animal that civilized man ever beheld. Not even the teeming herds of South Africa in their palmiest days could compete with this spectacle. No one ever counted the original buffalo population, of course. But Seton's estimate of 60,000,000 has been accepted as a reasonable guess.

By 1889, William T. Hornaday counted only 541 buffaloes remaining in the United States. The number of survivors in Canada, excluding the wood bison of the Peace River region, was probably very small. Quite probably there would be no plains buffalo alive today had it not been for a number of oldtime cattlemen. For sentimental reasons, or for experimental breeding purposes, small herds were maintained on a number of ranches from Texas to Alberta. In spite

Of the 5,000 buffalo in the country today, all but a small band in Yellowstone Park are fed and herded like domestic cattle

Frederick Remington's great painting of "The Buffalo Runners"

of these good intentions, the future of the animals was subject to the vagaries of individual human fortunes.

Conservationists then became aroused to the realization that something further must be done to assure the safety of the species, and the federal government was persuaded to establish permanent herds. A similar program was put into effect in Canada.

Yellowstone was the site of the first federal attempt to preserve the buffalo for posterity. Only twenty-five animals had survived the great slaughter there, and these were scattered in distant parts of the park. A nucleus of eighteen cows and three bulls, purchased from privately-owned herds was established a mile south of the headquarters at Fort Yellowstone. Later, four calves were captured from the wild herd and added to the experimental band.

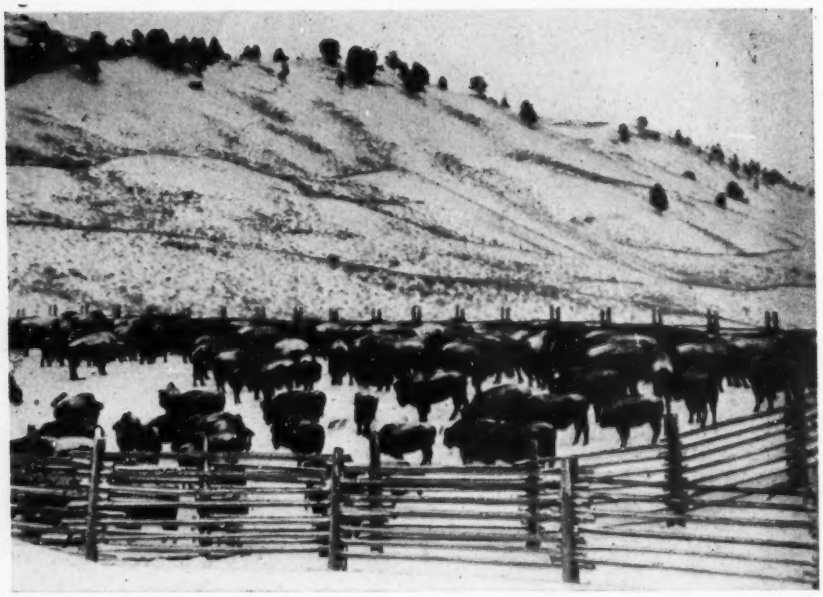
In 1907, this carefully nurtured herd and their progeny were moved to Lamar Valley in the park. There the "Buffalo Ranch" was constructed—barns and other buildings, corrals, pastures, chutes, runways, and traps. Every individual animal was carefully watched, guarded and practically prayed over. Shelters were provided against bad weather. All dangerous natural instincts were suppressed. Cows were segregated from bulls except for breeding. Calves were removed from their mothers at an early age to assure against accidental injury. Some were bottle-nursed. Almost every precaution was taken except to wrap them in cotton batting.

All of the buffaloes were fed throughout the winter. As the pastures became worn, feeding had to be extended into the warmer months. For the great amount of hay required it became necessary to clear and plow a large area of the park and sow it to cultivated grasses. Then an irrigation system was needed. The buffalo restoration project had become an elaborate ranching enterprise.

It was successful—too successful. The animals were eating themselves out of house and home. The herd eventually numbered over 1,200. From 1908 to 1943, a total of 2,625 buffaloes was removed from the Lamar herd, every opportunity being taken to dispose of the animals alive. Approximately 700 were shipped to zoos, parks, refuges, Indian reservations and other lands for exhibition or restocking purposes. Most of the important bison herds in this country were founded, at least in part, with animals brought from Yellowstone National Park. But a saturation point was often and quickly reached. The rest of the animals removed were killed at regular intervals and given to the Indians for food.

As the herd increased in size, the intensive management measures were dropped one by one. Fences were torn down and the buffaloes permitted to roam into the mountains during the summer. For years, however, they were rounded up in autumn and returned to Lamar Valley to be fed during the winter. The calves were allowed to take their normal chances of survival. Eventually, castration of bull calves was discontinued. But winter feeding of hay is still being maintained.

The disadvantages of artificial feeding of deer, elk and other hoofed animals are well known. Disease is spread much more readily when large numbers of animals congregate and stay on the same feeding grounds for months at a time. Wildlife that is placed on a dole loses its initiative and desire to hunt for such natural food as is available. The dead elk lying in piles on the edge of the feeding grounds of Jackson Hole, are elk that have gorged on man's hos-



Part of the 400 "tame" animals disposed of in Yellowstone early this year because of inadequate winter range. An equal number will gradually be made self-sustaining and turned out to make their way with the 350 wild buffalo now in the park

pitality. Instead of seeking normal food, they stand by shiftlessly, waiting for the next feeding. As a consequence, they have been easy prey for pneumonia, necrotic stomatatis, and other disease. Reindeer, once wild vigorous caribou, have become tame, dependent on man. After centuries of herding, they can no longer exist alone.

Although buffalo have seemed to resist many of the evils of artificial feeding better than the smaller, less rugged species, they are bound to be affected. Feeding, restraint by fences, constant culling, and other management measures may result in profoundly altering the physical appearance and the nature of the buffalo.

Changes in habit and temperament appear to have occurred already. Members of the "tame" herd do not seem to be as vigorous, as energetic, as hard, or as glossy-coated as those of the original herd of wild animals that has continued to exist and increase in Yellowstone without man's attention.

Because the twenty-five buffaloes surviving in 1902 were so wild, and because they persisted in secluding themselves in poorly guarded sections of the park, the authorities despaired of saving them. Attention was turned instead to the restoration project based on the "tame" herd in Lamar Valley. Much to everyone's surprise, the wild herd thrived and prospered. Wintering on and near thermal areas and on wind-swept ridges, the buffaloes slowly increased until at present they number about 350. Winter patrols find them making their living in Pelican Creek, Hayden Valley and Fountain Flats.

There is some interchange of individuals of these three bands and the Lamar "tame" herd during the summer. Once winter has set in, however, it is practically impossible for the wild bands to change their minds and reach the Buffalo Ranch for supplemental rations. Deep snows on intervening elevations remove any chance of switching boarding houses. These buffaloes are probably the only ones in the country that can be called primitively wild. Unrestrained by fences, they roam at will and find their own living and shelter.

There are now at least 5,000 buffaloes in the United States. Except for the herds in Yellowstone, they are all under fence. Many of them are fed, herded like domestic cattle.

How, then, can the buffalo be saved from domestication? Yellowstone is the largest wild animal refuge in the United States. Why have we continued domesticating the buffalo in Lamar Valley?

The answer, of course, is inadequate winter range for the number of animals. The problem of winter range in Yellowstone has been a major headache since the early days. Summer forage is there in abundance. But the men who drew the park boundaries were concerned with preserving the hot springs and the spectacular high mountain scenery. They did not realize that, when they excluded all possible agricultural lowlands from the park, they doomed the great game herds that they also admired. The realization—that the game animals could not survive through the winter on scenery alone came late.

A comparatively small acreage of winter range was added to the park, but it was not enough. A few thousand dollars spent on the acquisition of Yellowstone Valley area between the park and Yankee Jim Canyon would alleviate the situation. Until Congress is able to do that, large reductions of animals must continue to take place.

Over-grazing and over-browsing in the past have damaged what winter range there is. The buffalo must share this with some 800 deer, 300 bighorns, 1,000 antelope and 10,000 elk. Because of present inadequate browse, the deer are driven to more than normal grazing, and during the winter of 1942-3, half of them starved to death.

To suddenly throw the great Lamar herd of more than 700 animals on this already overburdened range would be disastrous. Therefore, the first step in restoring the buffalo to its natural winter feeding habits was the drastic reduction of numbers. This was accomplished in January and early February of this

year by the elimination of 400 animals of the "tame" herd, reducing the total, including both wild and "tame", to about 700 buffaloes.

Plans were then made to slowly wean the remaining "tame" herd from its boarding house habits and put the animals on a self-sustaining basis with the wild herd. A hundred nationally known scientists were first consulted for their opinions of these measures. They almost unanimously approved.

One lone voice protested: "Don't cheat the tourists! Give them 1,200 buffaloes—not a measly 700!" it said.

But it was decided that 700 healthy, vigorous wild buffaloes were worth more than 1,200 animals lazily waiting for hay. No one is interested in sightseeing domestic cattle.

Another objection heard was that reduction of numbers would risk extermination of the race. This was unfounded. The race is not endangered. The fortunes of the Yellowstone herds will not affect the more than 4,000 other buffalo that are now spread over the country—and the 15,000 in Canada.

Feeding, restraint by fences, constant culling and other management measures may result in profoundly altering the physical appearance and nature of the buffalo. The "tame" animals lack the vigor and energy of the primitively wild ones, shown at left

It has been alleged that the altitude in the Yellowstone area is too high for the buffalo without artificial winter feeding. Explorers and trappers, however, have left numerous records of the abundance of buffalo in the region in the early days. Apparently it was chiefly poaching, rather than the severity of the climate that reduced the number in the park to about twenty-five by 1900. As has been noted, the wild herds have thrived and increased without benefit of man's food or fences. If these buffaloes can do it, the Lamar herd can.

Whether the present buffalo population is still too large for the amount of winter range available can be determined only by experience and study. This summer most of the hay was left uncut as natural feed for the animals, and while this will probably suffice for some time, climatic stresses may make it necessary to dole out food from the reserve hay stacks to prevent acute distress in late winter. Details must be worked out as they arise, with ingenuity and sympathy for the animal subjects of the experiment. Ranch buildings, other facilities, and hay reserves will be maintained until it is determined that the buffaloes have made the adjustment.

Rustling their own food and searching out the most favorable winter habitat should restore a normally stronger and more vigorous and enterprising race. It will be interesting to see if the older buffaloes, winterfed all their lives, make the adjustment as quickly as the younger ones.

It is possible that some will migrate out of the park. However, feeding does not guarantee their staying within the boundaries, as 160 departed in the winter of 1942-3 and wandered down the Yellowstone Valley. Adjustment of the herd to its natural food supply should discourage any large exodus.

Eventually, it is hoped, a large area in the Great Plains will be reserved. There the primitive landscape will be as open and as majestic in its vastness as it was when the wagon-train guides set their course by the sun and the buffalo trails.

With the original game herds restored, modern-day adventurers can see a reproduction of that great aggregation of plains wildlife that astounded the explorers of long ago. Until such a home can be found for a large buffalo herd, the Yellowstone wilderness is the best place to preserve the species in a completely wild state.

Yellowstone is probably the only area at present where buffalo can roam without fences, without interference by man. For this reason, stockgrowers' methods should no longer be employed in this national park. It is hoped that in time the many acres of irrigated hay fields, the haystacks, the corrals and other structures can be eliminated, and that this area of Yellowstone be restored to its original condition.

A national park should not present a farm, a zoo, or a vaudeville. It should be passed on to future generations unspoiled—the greatest habitat of primitively wild animals in the United States. Upon Yellowstone Park may rest the responsibility of saving the plains bison from becoming a domesticated beast—of keeping it a truly wild animal with all its original characteristics.

CHECK-LIST FOR U

CHIEF Radioman George Ray Tweed emerged recently from a thousand days of hiding in the Guam jungles. He had what he needed to live off the land—the natural instinct of self-preservation, common sense, imagination and ingenuity. One by one he needed and found the usual things on a survival check-list—food, water, a bed, protection from weather and wild animals, concealment from enemies, and firewood. He went through every routine in the book from catching rain water for drinking and washing to weekly nocturnal forays for food.

"I was entirely on my own," he said.

There are more than 3,500,000 American soldiers outside continental United States. Their bases range from the jungle islands of the South and Southwestern Pacific to the desolate subzero wastelands of the Aleutians; from the deserts of Africa to the ruins of Rome; from China, Burma and India to France and the United Kingdom.

Our flight personnel are flying and fighting over the entire world. Mountains, jungles and oceans may pass below a man in a single flight. Dozens of planes are forced down in strange waters or stranded in strange lands. Anywhere on earth may be an emergency landing spot.

Both the Army and Navy are conditioning officers and men, arming trainees with skills and information which will enable them after such an emergency to return to safety and live to fight again. For these students of survival, sound and tried methods of enduring by land and by sea have been thoroughly investigated. The lore of polarcraft, plainscraft, and woodcraft is studied before the men take off for their battle stations.

"Your survival time will be in direct proportion to the knowledge and skill you have at your immediate command—your ability to improvise, and to apply specific information to your immediate needs," they are told.

Water can be obtained from any grapevine—but it should be cut first at the top, then at the bottom

Muddy water can be cleared by filtering it through a length of bamboo filled with sand and grass

RURVIVAL . . . .

By MARTIN ESKAY

Every Day Our Fighting Men, Operating Over the Entire World, Risk Being Marooned in Strange Jungles or on Far-Away Mountainsides, — But They Face These Dangers Armed With Skills and Knowledge Enabling Them to Survive — to Fight Again

These marooned airmen, waving excitedly to their rescuers, learned their survival lessons well. Right under the nose of the Japs, they had set up a camp and were building an escape boat

Men are up against so many kinds of things in global war, say the experts, "that you can't lay out survival *formulas*. Their best protection is in the possession of *basic information*." For example, "with an even elementary knowledge of woodcraft principles you wouldn't worry about a tiger being the cause of an unfamiliar noise in our North American woods because 'tigers can't happen here.' You wouldn't worry about malaria in the Arctic even if there are ten times as many mosquitoes per square mile in areas above the tree line as the highest average in the tropics —because malaria is a disease of warm climates."

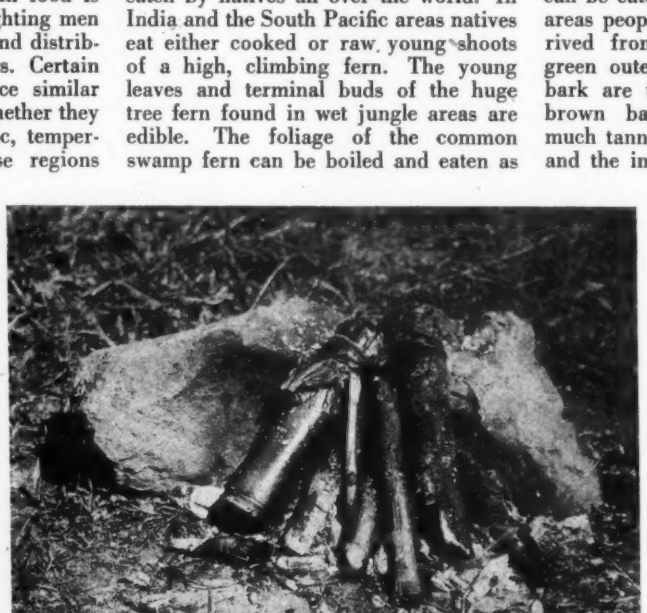
So into the brain cells of boys leaving

The men are taught to hunt for plant foods along streams or open water by digging for roots and tubers

Small animals—and various birds—can be trapped by tried and simple methods—such as the hanging snare

for far places go all the tips the services can assemble, and into their pockets go carefully prepared technical manuals covering north, south, east and west. The theme of the survival booklets is that it's a small world after all, and to a fellow who has been around it can be a familiar one.

Take food, for instance. All food is either plant or animal, our fighting men are told, so it is interrelated and distributed according to definite laws. Certain kinds of regions will produce similar types of plants and animals whether they occur in zones that are arctic, temperate, or tropic. Within these regions are still smaller areas such as streams, lakes, swamps, forests and grasslands, in which live specific forms of life. A stranded man who knows the edible plants and aimals of his own country can safely find and eat similar plants and animals in other parts of the world. If he hunted for squirrels at home, he will know where to look for squirrel-like animals in other lands. If he knew where and how to look for crayfish, clams, rabbits, or various birds—similar places abroad will have similar forms of life which he can seek in the same way. More than half the task of finding food lies in knowing what to expect in a given area and where to look for it.



Fire keeps a man warm, cooks his food, destroys harmful germs. Here water is being boiled in bamboo joints

When a plant appears to be familiar, the men are told to use it as they would that kind of plant at home. The persimmons of the Philippines or China, for example, differ from those in America, but they have characteristics by which they are recognizable as persimmons. Raspberries and blackberries are picked from thorny bushes near the edge of woods, fences, roads and trails. They will look the same when found in the Philippines, Pacific Islands, Africa, Australia, the Arctic and other areas. Blueberries and their relatives are found in practically all parts of the world except Australia. Of course, in temperate zones fruit of some kind can be found the year round, but Arctic fruits are ripe only during a short summer period.

Since many plants store food underground — especially aquatic plants — a stranded man, according to the survival manuals, should hunt for plant food by digging for roots and tubers along streams, swamps, or open water areas. Roots that angle or go straight down are more likely to end in a tuber than are the shallow, lateral roots. In cold climates where plant food is nowhere to be seen, bulbs and roots can be found by digging where dried plant stalks remain.

The men are told that the roots and young, curled fronds of many ferns are edible and none are known to be poisonous. For example, the brake fern is eaten by natives all over the world. In India and the South Pacific areas natives eat either cooked or raw young shoots of a high, climbing fern. The young leaves and terminal buds of the huge tree fern found in wet jungle areas are edible. The foliage of the common swamp fern can be boiled and eaten as a vegetable. It is found floating or attached to the soil in shallow, still, or slightly moving fresh water in the subtropical or tropical regions of America, Asia, Africa and Australia.

Edible nuts are the most sustaining of all raw forest foods and are found throughout the world. Many American nut trees have close relatives in the Tropic and South Temperate Zones, and familiarity with our own trees will help our fighting men recognize and locate nut-bearers in other regions. Seeds from cones of pines, for example, are edible and very sustaining. "It is not necessary to differentiate between pines," forest-wise troopers say, "shake or break seeds out of the cones and try eating them."

Nuts from the *auracarias* of Australia and New Zealand, Brazil, Chile, Norfolk Islands and New Caledonia furnish excellent food, according to the manual. These are lofty evergreens bearing globular cones containing large chestnut-like nuts which may be eaten raw just before ripening, or they may be boiled or roasted. Nut-producing members of the beech family, represented in North America by the oaks, beeches and chestnuts, are found in many parts of the world. Chestnuts, hazelnuts and walnuts are found in North America, the West Indies, Europe and all of Asia—the Philippines and the East Indies.

The inner bark from numerous trees can be eaten raw or cooked. In famine areas people make bread from flour derived from bark of trees; the thick green outer bark and white innermost bark are usually used for food, since brown bark ordinarily contains too much tannin. Poplars, birches, willows, and the inner bark of a few species of pine, including the Scotch pine of northern Europe and Asia and the lodgepole pine of western North America, are on the survival menu. Outer bark of these pines is scraped away and the inner bark stripped from the trunk and eaten fresh, dried, or cooked. It is most palatable when newly formed in the spring.

If the men recognize from each group a few common edible wild plants of the United States, they will be better able to recognize and use the same or related species in any part of the world, they are told. Wild onion is found in North America, Asia and Europe; sedge or nut grass and water chestnut grows in southern Asia and the Pacific Islands; and water lily plants are world-wide the year round. Sweet potatoes may be found in all warm climates in the world; Solomon's seal's fleshy roots boiled or roasted taste like parsnips. Bulrush roots grow in North America, Africa, Australia, East Indies, Malaya and may be eaten raw or cooked. Grain of wild rice is found in the tall grasses of North America and Asia along swampy streams.

Survival on the ocean depends upon the rations and equipment the stranded men have with them—and upon the degree of skill, ingenuity and resourcefulness of the men themselves. The Navy, Merchant Marine and Coast Guard furnish all life boats, rafts and planes with survival equipment. But "if you make your way to a strange shore," the fighting men are told, "remember that the sea beaches and shores of the whole world contain more easily available wild food than any other division of the earth. If you are stranded on the seashore in a warm climate you ought to be able to live *indefinitely* with small

(*Turn to page* 508)

POSTWAR CONSERVATION

The Department of the Interior Outlines Its Plans

THE Department of the Interior, in a statement made public in mid-September, announced a four billion dollar postwar plan for the lands and bureaus under its jurisdiction. These include the General Land Office, the Fish and Wildlife Service, the Grazing Service, the National Park Service, the Bureau of Reclamation, the Office of Indian Affairs, the Bureau of Mines, the Geological Survey and the Bonneville Power Administration. More than two million man-years of employment are visualized for war veterans and released war workers. The statement, in part, follows:

General Land Office

"As the federal government's chief real estate agent since 1812, the General Land Office, besides opening up resettlement possibilities for veterans, could provide nearly 18,000 man-years of employment over a period of several years at an estimated cost of approximately $47,000,000. The program includes such projects as development of public lands in Alaska, cadastral surveys, range improvements, and development and protection of the 2,500,000 acres of revested railroad grant lands in Oregon and California.

"An important part of the program also will consist of the disposal or administration of large areas of public lands that were withdrawn during the war for troop training grounds, bombing practice and other military purposes. The leasing of public lands for wartime mineral exploitation was a vital contribution to victory, and a judicious continuation of such development in peacetime is a distinct possibility. The handling of the legal intricacies and other administrative problems will add enormously to the General Land Office's postwar duties.

Fish and Wildlife Service

"Protection of the nation's billion-dollar game and fur assets and construction of facilities to furnish scientific assistance in attaining a potential annual production of seven billion pounds of fishery products are featured in the plans of the Fish and Wildlife Service.

"Anticipating a resurgence of both industrial fishing and an intensified urge of the amateur Izaak Waltons and Nimrods, it has plans to perpetuate our wildlife resources, which, besides furnishing a major portion of the recreational activities of a sport-loving people, are responsible for an annual turnover of $780,000,000 in fishing tackle, sports clothes and other accessories.

"The program, costing about $115,000,000, could provide approximately 55,000 man-years of employment spread over three years, if Congress approves. Much of the work can be performed by unskilled labor, since it involves such things as the construction and development of wildlife refuges, fish hatcheries and rearing ponds, stream and lake improvement, sewage and industrial waste disposal, reforestation and improvement of wildlife habitats.

"Scientific assistance to the fishing industry calls for such facilities as experimental stations and research laboratories, vessels for the development and exploration of fishing grounds and fact-finding surveys to provide comprehensive inventories of the industry.

"High on the list of 'musts' is also the control of predatory animals. War conditions have seriously disrupted this work. The situation is critical. Rodents and other predatory animals will be so numerous by the end of the war that sheep and poultry growing in many parts of the country will be hazardous.

Grazing Service

"Improvement of 142,000,000 acres of federal range lands in ten western states to provide a more stable and dependable source of livestock products is contemplated in the postwar plans of the Grazing Service.

"To accomplish this task it will be ready with plans for the construction of thousands of small range-improvement projects. These are grouped into fourteen major types such as water development, fencing, revegetation, erosion control, stock trails, bridges, truck trails, fire protection and the control of rodents and other predatory animals.

"Up to now the lack of such facilities has resulted every year in losses estimated in the hundreds of millions of dollars, greatly overshadowing in the long run the $226,000,000 estimated cost of the whole improvement program. Thousands of head of livestock, for instance, die of hunger and thirst in this vast expanse of semi-arid territory equivalent to all the New England states, plus New York, New Jersey, Pennsylvania, Maryland and Virginia. Besides, the losses from uncontrolled depredations of predatory animals, floods, forest fires and other damage from nature on the rampage are almost incalculable.

National Park Service

"Our national parks, some of nature's finest masterpieces, having been allowed to run down at the heel during the war, will require considerable refurbishing to play their part in the nation's tourist business, which before the war accounted for expenditures equal to that of the steel industry.

"Normal expenditures will require an outlay of about $11,000,000 immediately following the war, providing approximately 4,300 man-years of part-time labor. The long-range program—for parkways, secondary roads and trails, administrative, utility and residential buildings and other tourist-attracting facilities—calls for an annual expenditure of $21,500,000 over a decade, requiring annually 8,600 man-years of labor, mostly of a seasonal nature.

"National Park Service officials estimate that its annual outlay for improvements would average about one dollar per visitor at the 1941 rate of tourists to national park areas. This would be offset by the tax on gasoline used in getting there, whether the tourists use helicopters or automobiles. In 1941, for instance, more than 21,000,000 persons visited the nation's parks. The American Automobile Association estimates that during that year about 54,000,000 persons made motor trips in 16,000,000 motor cars, expending more than $6,000,000,000 on gasoline, repairs, hotels, amusements and other incidentals chargeable to having a good time.

"Since the parks are scattered throughout the country, such an expenditure would benefit all sections. In addition to the esthetic value of keeping our parks in tip-top condition, park officials believe that the investment in the tourist trade will be good business.

Bureau of Reclamation

"New and fertile farmland aggregating as much territory as the State of Maryland would be brought into cultivation as one of the many economic benefits resulting from postwar plans of the Bureau of Reclamation. If Congress approves, the Bureau will be ready when hostilities cease to proceed with 236 projects in seventeen western states.

"Completion of these projects would bring to virtual fruition the long-range reclamation plans that have been gradually taking shape since the reclamation laws were enacted. They are designed to harness the vast horsepower of the great western rivers that heretofore has been galloping wild.

"The Bureau's plans call for completing a major portion of construction work over a four-year period soon after the war. Actual construction would provide 553,000 man-years of employment, and the manufacture of contributory materials would require another 698,000 man-years of labor. The cost of construction is estimated at $2,952,613,000, all of which—except that portion dealing with flood control and navigation—would be reimbursable under the reclamation laws.

"Most of the program has to do with irrigation. The various projects would provide water for 6,707,639 acres of never-used but potentially fertile soil. In addition, supplemental water would be channeled to 9,365,295 acres of land on which farming is a precarious gamble due to inadequate and uncertain rainfall.

"The settlement possibilities are widespread. On the newly-irrigated land alone it is estimated that a good living is possible for at least 85,000 farm families, and 50,000 additional families can find room for profitable farming on the semi-arid land to be furnished with supplemental water. For every additional farm family settled on the fully irrigated land another family can find a good livelihood in new or enlarged villages and cities resulting from the development.

"The program should go a long way toward solving the postwar economic problems of the throngs of war workers who have migrated to the West to build ships and airplanes and other war weapons. Hydroelectric power, foresightedly developed before the war by the Reclamation Bureau at Grand Coulee, Bonneville and other sites, has been the lodestone attracting these hordes of war workers. And cheap hydroelectric power will play a large part in keeping them there.

Office of Indian Affairs

"To continue token payments on America's perpetual debt to the Indians, the Office of Indian Affairs has postwar plans involving the expenditure of roughly $150,000,000 in the United States and about $10,000,000 to help the natives of Alaska.

"Most of its projects already have been authorized. They form the continuing legal responsibility for the economic development of the Indians, including water and power development, conservation and development of Indian lands, forests and mineral resources, fish and wildlife protection, and the construction and operation of schools, roads, hospitals and other utilities. Work along these lines has languished during the war.

"Present plans call for approximately 45,000 man-years of labor, spread over the immediate postwar years. More than two-thirds of the cost will be self-liquidating through the collection of normal taxes.

Bureau of Mines

"New industries by the score, new jobs by the tens of thousands, new techniques, new weapons for combating unemployment—all are envisaged in the program of the Bureau of Mines.

"Recognizing that the war has taken the 'cream' of much of America's irreplaceable mineral wealth, the Bureau expects to send its research workers, engineers, chemists, and other scientific men into every section of the nation to chart the untouched reserves of coal, oil shale, oil-bearing sands, zinc, lead, iron, chromium, tungsten, magnesium, and dozens of other metals.

"Calling for an outlay of more than $11,000,000 in planning costs, the Bureau's postwar program, if Congress provides the funds, also will involve expenditures of nearly $157,000,000 for laboratories and other research projects. Stemming from this investment by Uncle Sam will be an estimated billion-dollar outlay in increased capital investments by industry as new enterprises and plants are created.

"In terms of employment to returning service men and women and to war workers, the program will spell ultimately nearly 600,000 man-years of employment, public and private.

Geological Survey

"A complete inventory of the country's natural assets, as a necessary prelude to their intelligent exploitation, is comprised in the postwar plans of the Geological Survey. When the shooting stops, that long-established diagnostician of the nation's economic condition, will be ready to present Congress with a fact-finding program calling for 27,000 man-years of employment. Designed to be spread over a three-year period, it is estimated to cost about $80,000,000.

"The Survey's plans are based upon the premise that all major reconstruction projects, public and private, to be successful, will depend upon having certain basic information that that agency is best equipped to provide. Its program covers four main phases: maps, minerals, water and geology.

"There is still much to be done before we have adequate maps, particularly of the kind necessary to intelligent planning of industrial development. Adequate topographical maps, for instance, are available for only approximately forty-seven percent of the land area of the country. In cooperation with the Army Air Forces, the Survey has provided the armed services with maps covering more than 5,000,000 square miles of territory in various parts of the world. These have been developed from aerial photographs made with specially equipped planes. They could be used to great advantage in the aerial mapping of the unmapped portions of the United States and its territorial possessions.

"The conservation and proper use of water will present one of the country's major postwar problems. Advances in industrial processes, air conditioning, sanitation, irrigation, water power and general living standards have multiplied our demands for water.

"The program calls for a nationwide survey to determine the depths, thickness and aerial extent of all water-bearing formations, and the establishment of a network of observation wells through which to measure the fluctuation of underground water sources and look out for impending shortages. It also includes increased activity in stream-gauging and other measures designed to keep the pulse count of surface-water sources. Such information is necessary for adequate programs leading to effective flood control, as well as for such purposes as irrigation, industrial and municipal supplies, planning for dam sites, navigation improvement and for dealing with interstate problems relating to the use of rivers flowing through two or more states.

Bonneville Power Administration

"Cooperation with five Pacific Northwest states in transforming that potentially rich region from its wartime industrial mushroom growth to the hardy perennial it hopes to become will be a primary postwar function of the Bonneville Power Administration.

"To that end, and also to protect the $400,000,000 investment in power-producing facilities, BPA is getting ready to utilize the God-given assets of the Columbia River Basin in a variety of peacetime pursuits to the perpetual benefit of both the Northwest and of the nation as a whole.

"This situation poses a problem, immediate and remote. At the end of the war, the immediate question will be what to do about the 250,000 persons employed in shipbuilding and airplane industries, compared to 10,000 in 1940. If their skills can be utilized, these workers will constitute a tremendous industrial asset instead of a relief problem.

"To the long-range problems both BPA and the five states concerned are looking forward with confidence. So much so that the states—Wyoming, Idaho, Montana, Oregon and Washington—have formed the Northwest States Development Association, in which they have agreed to pool interests in devel-

(*Turn to page* 512)

DUCK HUNTING vs. DUCK SHOOTING

By FREDERICK C. LINCOLN

JIM was wrathy! He stamped into my office, slammed his hat on my desk and exploded:

"What's the use! A few years ago I could go down to the club almost any day of the season and kill a limit of ducks, but now with all your blamed regulations, I'm lucky if I get a pair. I'm about ready to give up duck hunting and sell my membership if I can find some sucker who'll buy it."

"Hold on a minute, Jim," I counselled, "just how long has it been since you really went duck hunting?"

"Why, the last day of the season, of course."

"I said *hunting*, not *shooting*," I replied. "Jim, you haven't done any duck hunting in the last fifteen years to my certain knowledge, although I'll admit you have shot a lot of ducks in that time—more than your share, in my opinion."

If accused of murder, Jim's face could not have looked any more puzzled.

"Say," said he, "just what are you driving at?"

"Simply this," I explained, "during the last twenty-five years the art of duck hunting has become more or less lost in favor of the easier, highly artificial duck shooting."

Jim's case is today typical of hundreds, possibly thousands, of others, and the truth hurts them so much they do their best to refute the arguments. Nevertheless, the facts are clear—the easy "guaranteed" shooting of yesterday is gone. And the sorry part of the story is that only occasionally will one admit that the deadly methods which were in vogue a decade ago were in any way responsible for its passing. It is so much easier on the conscience to place *all* the blame on drainage, drought, botulism, lead poisoning, or the unjustly persecuted birds of prey.

The author doesn't claim to be one of the real "old timers." But he has been an ardent small-game hunter for some thirty-five years. In that time he has shot ducks in Colorado, Illinois, North Dakota, Michigan, Ohio, Maryland, and South Carolina, and has

worked during the shooting season in the waterfowl areas of several other states when there was plenty of opportunity to see how others hunted.

In looking back over these years of pleasure with the old double scattergun, the *hunts* that have made the most lasting impression for the pleasure they gave were, with possibly one exception, those bitterly cold days along the sloughs of the South Platte River in eastern Colorado. True, the bag always was small, rarely going over three or four mallards, with possibly a brace of racy little green-winged teal thrown in for good measure. But—they were earned fairly.

It usually meant a long stalk, frequently a crawl on the snow or frozen ground behind the thin screen provided by the low bordering growth of leafless willows, to get within range of the keen-eyed birds on the ice at the edge of an open place in the channel. It was a rare event for the first stalk to be successful, some unlucky movement or sound putting the birds into the air while still well beyond effective range.

Finally, however, patience and caution would be sure to win and when the birds jumped! Glory be! They were within range. A fast-rising mallard is never an easy target and on those occasions when "right and left" clean kills were made!—that was something to crow about.

A young medico with whom I used to hunt in that region had a stunt that when it worked was almost uncanny. Crawling forward together side by side, as we finally got within range and by sign language would prepare to raise up, he would pull off his left glove and with his little finger clip two extra shells against the palm of his hand. He shot fast and his gun had automatic ejectors, and on at least two occasions I actually saw him kill two birds, reload and drop two more. I often tried it but never could get the second pair of shells in fast enough.

We never started out with two or three boxes of shells apiece. In fact, I doubt if we ever made a hunt when the combined contents of our shell pockets would have filled a single box. We just didn't need them. But we did have fun and the clink of glasses in the evening in the so-called "laboratory" of the Doc's office wasn't to the "limit bag" we had brought down, but to a day's honest

Above—"It usually meant a long stalk to get within range of the keen-eyed birds"

Center—"A fast-rising mallard is never an easy target"

Below—"A veritable stream of birds passed over us"

sport. As a matter of fact, I doubt if either Doc or I had the slightest idea what the legal limit was but I don't recall a single hunt when our combined bag was ten birds.

While I unhesitatingly toast those days as first in my sports calendar, there's that possible exception—those duck passes of North Dakota. I wasn't initiated to them until 1929, but I must admit that for real "sporty" shooting they are hard to beat. In the vicinity of Dawson, "The Colonel" had on his preserve a lake shaped somewhat like a dumbbell, the "handle" being a long peninsula that almost cut the lake in two. This point was on the side of the lake opposite the hunting lodge, and it was customary to wade across the two or three rods of shallow water.

The crest of the point was twenty-five or thirty feet above the level of the lake, and for most of its length it supported a fairly dense growth of Juneberry and other shrubbery but the last hundred yards or so was overgrown chiefly with weeds. In this section, some twenty or twenty-five yards apart, five pit blinds had been dug, their edges marked by a ring of weeds. It was as perfect a setup for pass shooting as I have ever seen.

I had been on the preserve for a week or two before the opening of the season getting a banding station in operation, but when the Colonel arrived with four guests for the opening day, he generously invited me to stay and have a shoot. Accordingly, at daylight on the opening day, I found myself in the center blind on "the point," with two of the Colonel's other guests on either side of me, while the Colonel himself went off to see how his pheasants were doing. Each of us had one hundred shells.

What a morning! From my trapping experiences of the previous week or two I knew that most of the ducks then in the vicinity were redheads and pintails. Why they should want to fly from one end of the lake to the other every morning, I don't know, but there probably was a very good anatine reason, since for about two hours, a veritable stream of birds passed over us, some so low I felt tempted to try a bare-handed capture from mid-air. But how they did fly! Veritable winged bullets!

"... Occasions when 'right and left' clean kills were made"

The fusillade was almost continuous, the Colonel remarking afterwards that it sounded to him like a second attack on Belleau Woods. Having plenty of trouble myself in connecting shot and feathered meteor, I at first paid scant attention to the doings of my companions, but the reports of their guns were constantly in my ears. Finally, however, after I had fired some fifteen or twenty shells to bring down three birds, I decided it was time to let a better man do it—if such were present. I called over to Mr. Greene on my left: "What luck?"

"Say," he replied, "I think the Colonel is playing a joke on me and has given me blank shells. Nearly two boxes used and I haven't killed one."

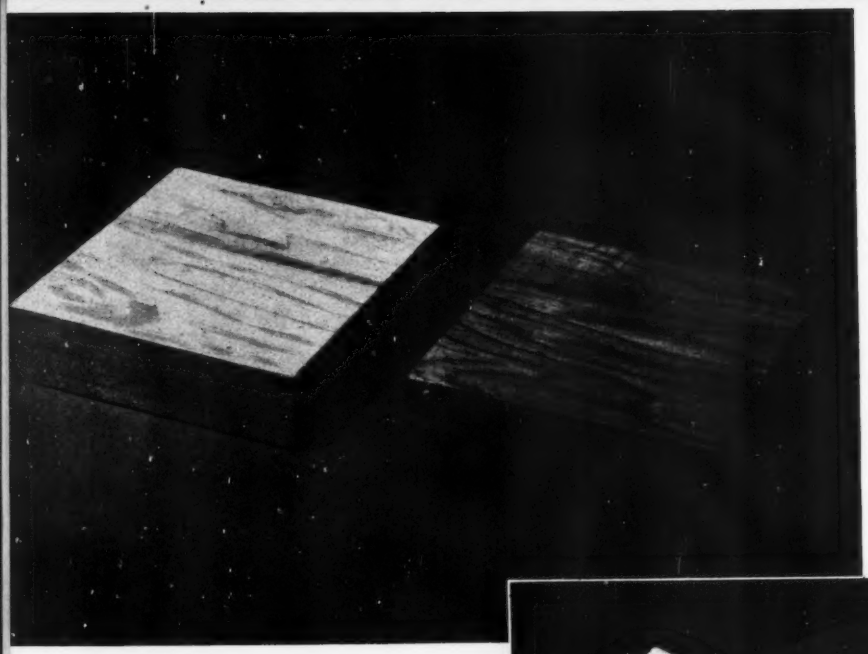
Frank Hughes, in the blind beyond, apparently had had the same idea as he joined the exchange by shouting: "That's no alibi, Dick, I cut open one of my shells and they're loaded, all right. Just the same I've seen plenty of these birds wink at me as they went past."

Finally, at about eleven o'clock (the Colonel permitted no afternoon shooting on his preserve) we called it a day and gathered up a total of eleven birds, while a check of ammunition showed that nearly 400 shells had been fired. It was, however, grand sport, and despite the frequent wise-cracks directed toward the display of marksmanship, I don't recall a single rueful face as that evening we sat down to the roast pheasant and champagne served in the inimitable style of the Colonel's steward.

Now the contrast. It isn't pretty and I'm not even going to name the state,

(*Turn to page* 504)

"... Corn is everywhere, literally bushels of it"

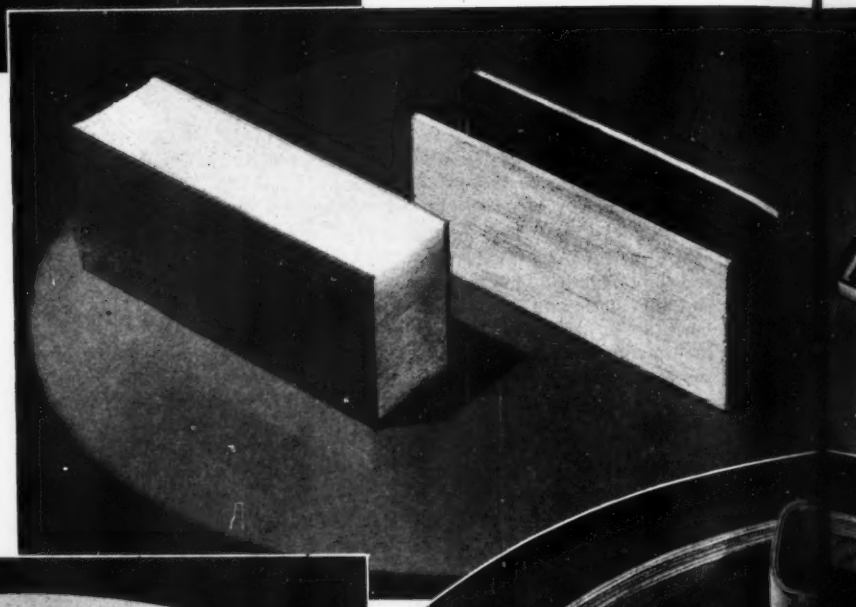


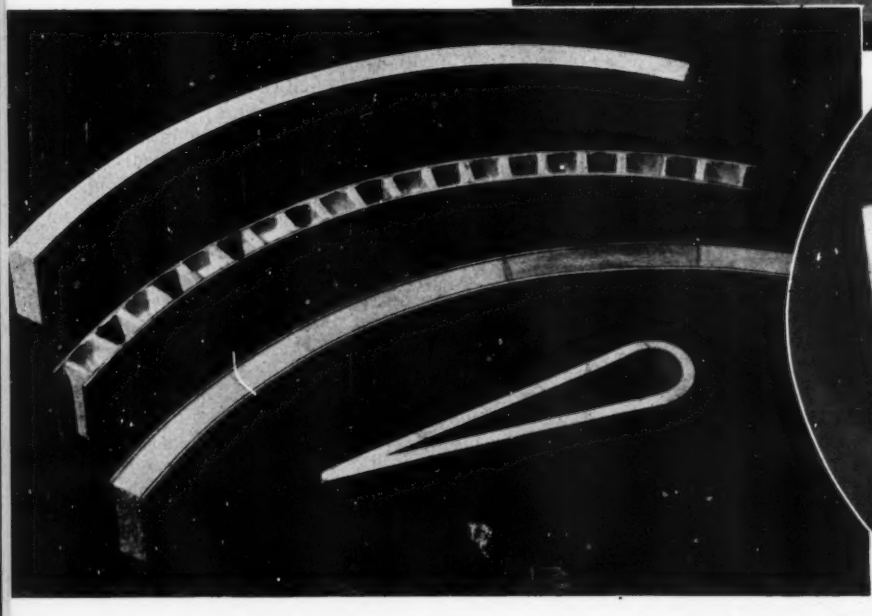
Wood of T

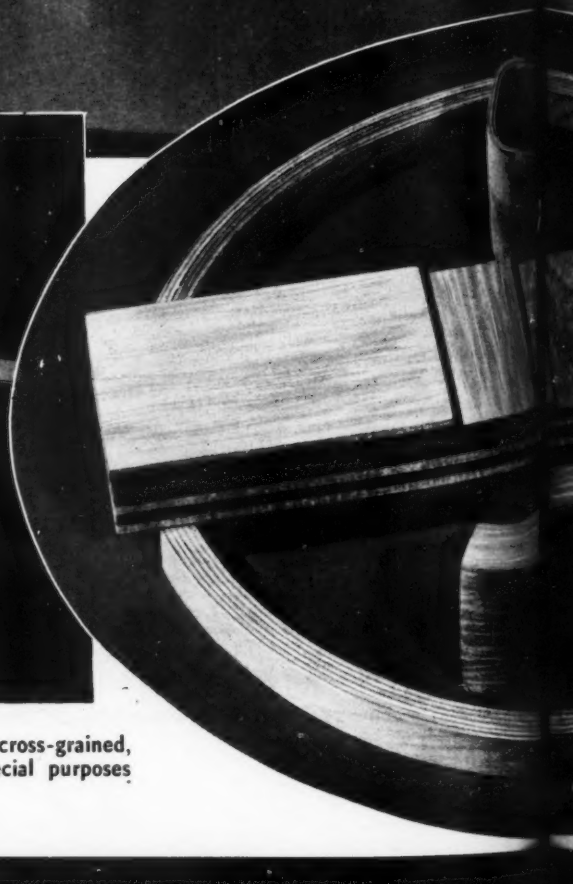
The story of new wood derivatives an the wo modified wood products, many of which hav Labora been highly developed for war uses, cannot b other told in full at this time. It is possible, how- compe ever, to present pictorially some of the new other developments and improvements on the old— the p

"Staypak" is the name given wood compressed across the grain to prevent "springback." Above are shown samples before and after stabilization by heat and pressure. Density of some woods may be more than doubled

Success in bonding wood to wood has resulted in forms of composite, or "sandwich" construction. At right, pure cellulose acetate (white) faced with papreg, a paper product, and carbonized rubber faced with plywood. Below, samples of curved sandwich construction — balsa faced with papreg, grid core faced with plywood, plywood-faced balsa, used in the famous Mosquito bombers, and an airplane tab section of balsa faced with plywood



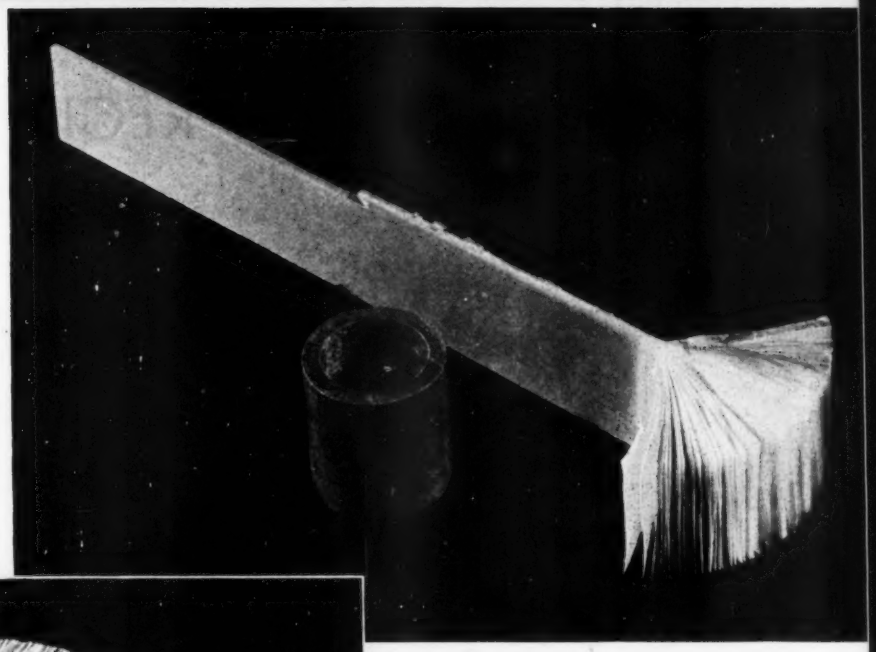


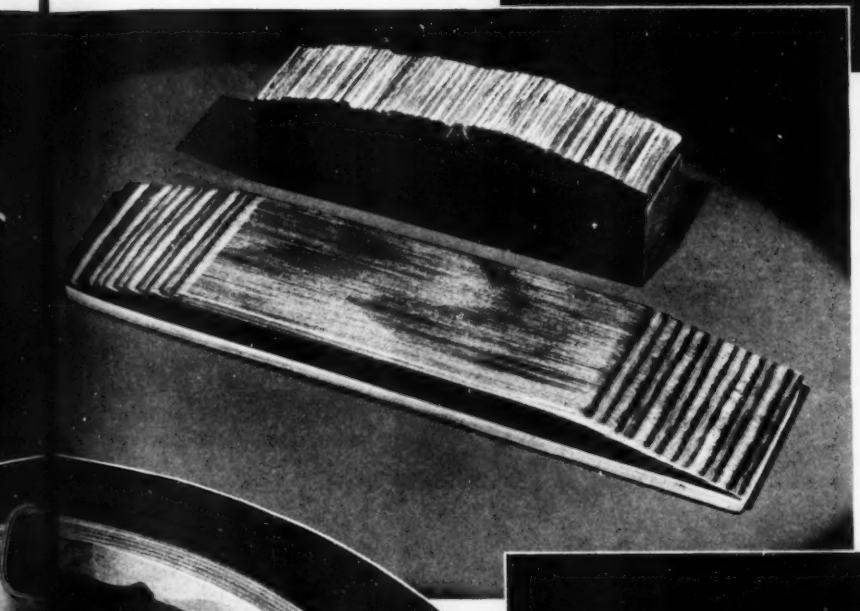


Plywood (at right), sheets of veneer glued together cross-grained, now can be moulded into various shapes for special purposes

# of Tomorrow

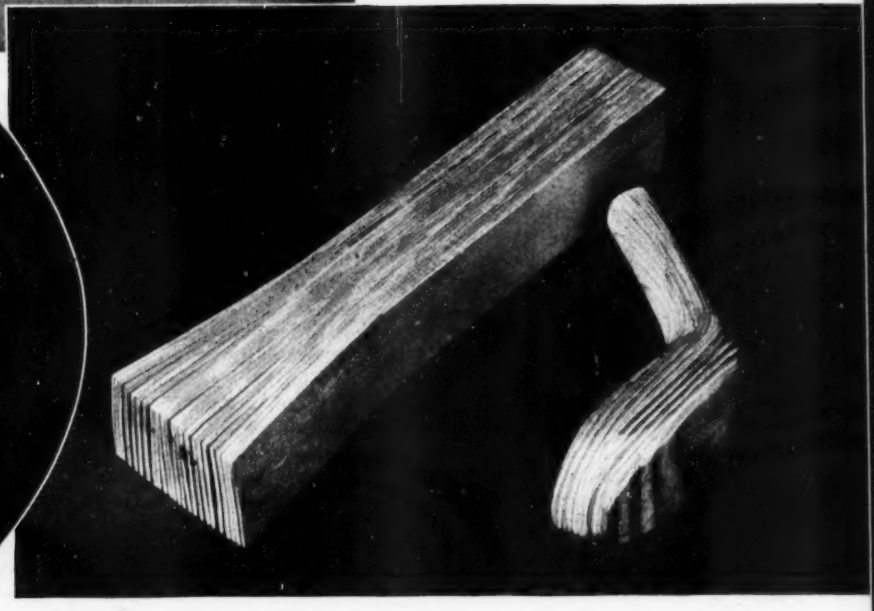
the work of the United States Forest Products Laboratory at Madison, Wisconsin. These and other forms of improved wood, capable of competing with metals, plastics, ceramics and other products, will likely play a big part in the postwar world. Watch for them.





"Compreg," at left, and "Papreg," above, are names given layers of wood and sheets of paper impregnated with resins and put together under pressure and heat

The samples of compreg show birch wood layers with beveled ends, and a section of about 200 laminations with uncut side and polished surfaces. Papreg, the paper product, is lighter than metals and as strong as some and can be compressed into simple shapes or moulded into curved patterns. It is resistant to moisture and extremely stable at both high and low temperatures. Both compreg and papreg are resistant to denting and scratching and have surfaces requiring no special finish



Laminated wood, two or more layers glued together with the grain parallel, achieves greater strength and economy of material

THE ANTHRACITE REGION DISCOVERS ITS "SURFACE" — By R. D. FORBES

PART II

Fire, like the ax, has left its mark in the anthracite region

THE accomplishments of Stanley Mesavage, described in the preceding issue, did not go unnoticed in nearby Wilkes-Barre, where the Wyoming Valley Chamber of Commerce had set up committees to deal with major community problems. The Valley (that portion of the Susquehanna Valley from Pittston to Nanticoke) was uncomfortably aware of what mining had done to the beautiful watershed of the Susquehanna. At the head of a committee "to do something about it," Col. T. H. Atherton had the support of women's clubs, business executives, and the rank and file of progressive citizens. In Stanley Mesavage's tireless enthusiasms and practical suggestions this committee found constant stimulus.

Eventually contacts with the Allegheny Forest Experiment Station of the U. S. Forest Service at Philadelphia, made by Mesavage and Arthur Bolender, far-sighted secretary of the Chamber, evolved a plan for federal aid. In the spring of 1939 Congressman (now judge) J. H. Flannery was persuaded by the Chamber to introduce an amendment to the current appropriation bill for the Department of Agriculture which would provide the Allegheny Station $18,000 annually for a "survey of present and future opportunities for forest employment in the anthracite coal region of Pennsylvania."

Nowhere in the state had unemployment been more acute, not only during the depression but for nearly ten years previous to it. As early as 1924 the demand for anthracite had dropped to half of that of 1917, and greater use of machinery in the mines had increased the average daily output of coal per man from two to three tons a day. Of miners alone, 50,000 were more or less permanently out of work.

Introduced late in the session, the amendment made no headway in House or Senate committees. But Mr. Flannery had gained for it the support of Senator Joseph Guffey of Pennsylvania. Judge Flannery still tells with a chuckle how it fared on the floor of the Senate. "The Senate had before it the appropriation for the entire Department of Agriculture, carrying hundreds of millions of dollars. It had voted down amendments right and left. Mr. Guffey rose at an appropriate time and offered ours. When the presiding officer called for a vote, Senator Guffey, a couple of the page boys, and I in the gallery said 'Yes.' 'Those opposed?' There was a chorus of 'No' that rattled the windows and doors and re-echoed to the very rafters. 'The ayes have it and the amendment is carried' blandly announced the presiding officer. He glanced at the Committee chairman in charge of the bill, who might have challenged the ruling. But that Senator was suddenly intent on the contents of his briefcase, and the item stuck when the bill went to conference. That's how the Allegheny Station got its money for the Anthracite Economic Survey."

"A survey of present and future opportunities for forest employment in the anthracite coal region of Pennsylvania." Behind the stodgy language of the appropriation, the Chamber of Commerce at Wilkes-Barre nourished the hope that

some day the anthracite region, like the prophet of old, would say: "I will lift mine eyes unto the hills, whence cometh my help." In spite of fire and ax, these hills were still clothed in some sort of forest. The region, with state aid, had made a long struggle to overcome forest fires. Now, with federal aid, it might hope to banish the menace of over-cutting.

From headquarters in Wilkes-Barre, the survey went to work. In charge locally was Clement Mesavage, brother of Stanley, to whom in part he had owed his opportunity to take the forestry course at Penn State. The task was twofold—first to appraise the opportunities for immediate employment in the forests of the anthracite region, and second to investigate long-term possibilities. The great need of the region was for "public works" to keep jobless men and their families from dire want. An intensive system of truck trails and firebreaks through major forest areas would require plenty of hand labor, and tentative plans for constructing them were already at hand. The survey publicized the general plan, which called for 2,500,000 man-days of labor in the region, and listed in detail the improvements proposed for the Wyoming Valley.

Unfortunately, somewhat less than enthusiastic support for this program of work, which had originated in his own organization, was given by the Secretary of Forests and Waters of the State, and local support for the Wyoming Valley projects met disheartening objections in the WPA. Some day, in spite of bureaucracy, these or similar aids to forest fire protection will be constructed, to the great and permanent benefit of the region.

Objection to the fire protective improvements had centered on the fact that nearly all of them would have to be built with public funds on privately-owned lands, because sizable state forests are confined to only two counties of the region, and the area of state game lands is small. The survey, therefore, undertook to learn from county records the acreage of tax-delinquent private forest land in each county. This land was headed toward public ownership. It was found that some 63,000 acres in the fifteen counties of the anthracite region had been delinquent well beyond the period allowed for redemption, and that

Steps toward the region's rehabilitation include — *upper*, inventory of forest resources and potentialities; *center*, drive to change standard practice of mine logging, which removes every tree regardless of size; *lower*, better fire protection

a comparable area was about to revert to county ownership for non-payment of taxes. The survey recommended to the counties that they take advantage of a Pennsylvania law passed in 1933 at the request of the Pennsylvania Forestry Association, and place some of these lands under administration as county forests.

The major project of the survey has been an inventory of the forest resources and potentialities of the region. Without such an inventory it is impossible to set any goals for the development of forest resources or to advocate convincingly any plans for attaining them. Purchasing agents for coal companies as a rule had felt that local supplies of mine props, and certainly of lumber for mine use, are hopelessly depleted. For years the railroads of the region had obtained locally scarcely a cross-tie. They complained bitterly that as soon as a tree attained prop size in any local woodland it was pounced upon and carried off to the mines. Industries making intensive use of wood, and thereby employing any significant number of wage earners, were almost absent from the region, or obtained their raw material from distant sources.

Could new industries be attracted to a territory where wood was scarce, and getting scarcer? Was there any use in talking about alleviating unemployment by utilizing forest resources?

The answer to these questions might indeed be "No!" if for the region as a whole the facts were as generally assumed. To get at the truth of this assumption, the survey organized a WPA project. With aid supplied by James Girard, assistant director of the nation-wide U. S. Forest Survey, instructions were drawn up for the forest inventory. This involved grid-ironing Luzerne County with compass lines crossing the main streams and mountains at right angles, and tallying the trees, by size and species, on sample areas laid out at intervals wherever the lines ran through forest land. Air-photos of the region were used to prepare the finest county map of forest areas and conditions that has been made in the northeast in recent years.

The preliminaries over, Clement Mesavage worked tirelessly with the project leader, an ex-fire inspector of long experience with the state, to train WPA crews in the simple but exacting methods of forest surveys. Drawn from every walk of life—unemployment had engulfed the white-collar worker of the hard coal region as frequently as the artisan and laborer—the crew members quickly responded to the worth-whileness of the job. Any outdoor job, not too strenuous, might not over-tax for a summer the WPA worker of the cartoons and the campaign literature. But it took earnest men, capably led, and refusing to consider themselves as public pensioners, to follow 310 miles of compass line through scrub-oak thickets, over rugged mountains, and in snow and mud, while keeping records of forest conditions that had to maintain exacting standards of accuracy and judgment.

In the meantime, other WPA workers, mostly women, were checking, compiling, and computing the statistical material constantly flowing in from the men in the field. And members of the survey staff proper were conducting studies of the wood used yearly for all purposes in the county, the quantity being cut from the woods within its borders, and the number of men engaged in lumbering operations, sawmills, and the one industrial plant—a handle factory—remanufacturing wood.

The published report on this inventory shows, briefly, that Luzerne County, in spite of a population of nearly 500 to the square mile, is sixty-three percent wooded, and that of 365,000 acres of forest land there were still in 1940 nearly 30,000 acres of sawtimber, and 82,000 acres of merchantable cordwood, including much wood suitable for mine props. Rates of growth, based on tree borings, show that forest soils are good; sawtimber is adding to its volume 3.5% annually, and cordwood, 6.6%.

Not so bad for one of the counties suffering most from forest depletion! Unfortunately, however, local sawmills and prop operators continued to whittle away the better timber. "The heavy demand for mine timbers puts tremendous pressure on the forests. Operators scour the county for timber large enough to make props. Clear-cutting is the standard practice regardless of age or size of trees. The county's forests are unable to supply more than one-third of the mine-timber requirement, and depletion of adjacent areas prevents the forest from having a breathing space in which to restore growing stock."

By "adjacent areas" the report means the surrounding counties. The question is whether the other counties of the anthracite forest region—those surrounding the coal-producing counties—can come to the latter's rescue. To answer this question the members of the survey staff planned from the beginning to extend the forest inventory to all of the fifteen counties. In spite of skepticism as to the value of the extension on the part of the Forest Service hierarchy, the inventory went forward, and before Pearl Harbor eliminated the WPA, it had covered two-thirds of the counties.

The survey planned to publish for each county, in popular form, such essential information as has been summarized above for Luzerne County, and to make concrete suggestions for stopping further forest depletion and making full use of wood surpluses. What these suggestions might accomplish in each county was to be translated into terms of employment. In Luzerne County, it was estimated that by 1980 the number of men permanently employed in forest industries might be increased from the present insignificant figure of 275 to at

(*Turn to page* 500)

Mesavage points out the slow, natural reforestation of a mine refuse bank, with another coming along in the background

THE WOODS I KNEW

By HOWARD J. SHANNON

In Spring, the unfolding leaves of the sweetgum

SOMETIMES a simple incident will act like an evocative power to summon into living reality a long-forgotten day whose quietly uneventful happiness we have never been prompted to remember. Such a miracle occurred quite recently. When I discovered in a dusty portfolio a long-lost sketch of the hills and woods which once overlooked my boyhood town, the landscape seemed to live again with the glowing light of a veritable resurrection. How strange that this could be true! For now only an aggregation of brick and stone occupies that pleasing Land of Yesterday. Yet its influences can be lived again, at least in memory, as we view these Long Island woods of fifty years ago.

The weasel—a warily moving form in the uncertain light

Today I seem to recline once more upon the grass of our highest hill, and while every leaf on the hilltop grove above me hangs motionless and the wide world lies in peace below, I look up into the blue sky. A realm of cloudless azure it is, so calm with all the spaciousness of the summer heavens that only the wheeling swallows seem alive. Occasionally they accelerate their pace with a flutter of wings that is immediately stilled, and the birds continue their effortless rounds beneath the sun until the essence of that hour lives again in all its magical stillness of a waking sleep.

Below lies the town whose rooftops and steeples are half-hidden among masses of dark trees. These spread widely away until they fade into the great salt-marshes which border the distant sea. Its dim blue reaches are seldom absent from the sight of one who roams these hills; but, in those early days, my interest was claimed by the friendly woods.

Their promise of adventure was naturally accepted by the wondering eyes of a youth who sensed the opening of ancient mysteries and the working of their ageless spells. These were most persuasively revealed in the beech-grove which crowned a neighboring height. For there the curious intricacy of fretted shadows from shelves of emerald leaves checkered gray boles and bronzed grass alike with a pattern of mysterious shade. This emphasized the intriguing light in which all things seemed to float, and suffused the realms above where the spreading foliage formed a roof. Here the brilliant orioles and warblers flashed as they sang again and again.

Then, too, the occasional quacking of ducks could be heard from a wooded hollow to the north, betraying an unsuspected pond. Can I ever forget its delights? How often the leafy ways were followed downward through detaining thickets which half-hid the lane until its mossy bank was glimpsed, then the sheen of water, shining quietly within this hidden hollow. Embowered oaks and maples, towering loftily toward the sky, were repeated as faithfully in the dark depths as the fans of lower leaves drooping to touch the dimpling surface. Between this arborescent reality above, and its reversed image below, flat leaves of the pond-lily were afloat among the pure white flowers.

Here I would fish, and patiently watch the "bobber" as it occasionally

stirred. Perhaps a "sunny" would take the hook, or a salmon-colored carp, iridescently golden as it was lifted from the water. Or a small turtle would leap from a floating log and awkwardly paddle toward shore. Simple incidents these —yet so momentous during those timeless hours I spent beside the pond. For this was my own adopted realm, so withdrawn from the busy town that only the faint ringing of a distant bell would sometimes be heard to remind me of another world.

Its interesting sights accompanied every season. They were particularly striking in autumn due to the presence of sweetgum trees. Vermilion streaks appeared on their yellowing leaves that sometimes deepened to orange, or scarlet splashes encroached over deep crimson while, on some leaves, a purple sheen tinged the rich hues of mahogany or a veritable ebon black. Surely no other northern tree displays such a gamut of autumnal color as this frequenter of swamps and ponds. Ranging along the shore and scattering their painted leaves in the water below, the sweetgums also dropped their spiny seed-capsules to float uncertainly about until they became half-frozen in the first ice —a hazard for adventurous skaters. Yet I hold no grudge; perhaps those trips and falls were friendly reminders to direct my attention more forcibly to this tree.

With the coming of spring I saw how strangely beautiful the unfolding leafage of the sweetgum really was. The flower buds surmounting each terminal twig were surrounded by a circlet of five or more unfurling leaves, so infantile they seemed the leafy quintuplets of the woods themselves upreaching their five-fingered palms to the sun. Indeed, a subdued celebration about all those blossoming borders accompanied the song sparrows's strain, so strangely sweet it seemed the evocative spirit of spring itself expressing its pleasure.

Soon the lordly chestnuts would bloom along the heights (they had not yet been destroyed by blight) while the tuliptrees, hickories, walnuts and dogwoods contributed to the vegetation which once clothed the backbone of our Island's hills. Had it not been for ravine-like passes which penetrated these heights in a north-to-south direction (a result, in some cases, as I afterward learned, of the old glacial outflow scoring this terminal moraine) and thus supplied partial passage for a public road, these woods would have been only infrequently invaded by man.

Within more extensive swamps one foresaw, in fact, the possibility of actual discovery. Would not the rarer animals of this once populous region have retreated and immured themselves in these old glacial quagmires? Let us see what investigation will disclose.

The uncertain light had hardly faded behind me, and the damp darkness gathered around before I paused, aware of something sinister. Were those warily moving forms the half-wild dogs I had heard about—but never seen? Was that dry stir the rustling length of a disappearing snake? Now a dark-furred mink silently passed, a creature long believed to have become extinct hereabouts. Then a heavily moving body was heard slowly pushing forward. Was it—yes, it was, a large turtle, an ancient individual which had lurked so long undisturbed as to have attained quite remarkable proportions. Suddenly beating wings swished directly overhead as a watching crow wheeled away to arouse his companions. Alarmed cawings broke forth, and were taken up by more distant congregations gathered within the less explorable regions of this extensive swamp.

Significant fossils of an ancient marine life found on Long Island—trilobite and brachiopod on rock of the Devonian Age

Soon a mournful and curious call issued from the treetops, to be repeated several times. It seemed quite unfamiliar; yet a similar note had sometimes floated from the giant wild-cherry tree overspreading our familiar dooryard, a minor note which seemed aloof even there. Far deeper was the spell it laid upon my heart that day; the arresting moment of a mind's awakening to its own identity became potent as this seldom noted bird brooded above me in solitary self-communion. A feeling of loneliness followed; yet the woods were not uncompanionable. Could that bird have been really a clape, as a boyhood companion once told me? It was a disturbing note in those early carefree days.

Passing years asserted their practical claims, and these communions became more rare. But the summer sun still shone upon our dooryard, the tree-shadowed avenue, and the hills, as well, with an unfailing invitation. The summer grass glowed so warmly green and the upper woods, which crowned the nearer heights, stood so serenely confident in their unbroken trance that all things about me seemed expressive of something most other days habitually obscured; a calm reticence of such lofty and consummate beauty as seemed too intimately at one with the hopes and aspirations of the deep heart of man to pass without grateful recognition and a reverent acclaim. True, such impressions are not capable of scientific analysis, but they became, nevertheless, the guiding influence of our days. Even the insects wakened to these meteorological influences. An ethereal singing, like chimes of fairy bells, came from a nearby thicket where a tree-cricket clashed the cymbals of its wings; a whirring grasshopper rose from the roadside dust, mounted high and clapped its wings before settling to the side of its waiting mate; and moved by more mysterious influences still, monarch butterflies appeared and flapped slowly westward along Long Island in irregular processions. The great rhythm of life of our northern summer had now reached its height, and was moving every form alike toward the fulfillment of its mysterious destiny.

After a time, a more matter-of-fact attitude toward the outdoor world su-

pervened. Analysis took precedence over general impressions: the how and when of our landscape's origin were questions which demanded an answer. And those answers lay close at hand. In gravel pits near the Island's northern shore, and in outcrops, here and there, were deposits of old fossil leaves revealing the ancestral types of our trees of present day, and their geologic age. Here could be unearthed ancient oaks, tuliptrees, walnuts, maples and many others with leaf-forms quite different from those of their descendants.

One day I found a far different and shell-encrusted rock whose fossil impressions led backward into realms of time profounder still. These sea-shells, or brachiopods, were Devonian species, and therefore confirmed the evidence already supplied by a trilobite impression preserved on the same rock surface (representative of a type of Devonian life never before found on Long Island), namely, that this kind of rock did not originate here, as no such geologic formation has ever been found in place on the Island. It must have been brought here by the great Glacial Advance of 30,000 years ago when it moved down the Hudson Valley. Similar rock formations, representing the Lower Helderberg deposits, are found in place no nearer than a region fully fifty miles away, in the Hudson Valley beyond the Highlands. It is possible, therefore, to indicate the actual source of some of our Island's structural materials.

But all of this, you say, belongs to the past. Has it any specific relation to our own time? Yes, it has. Our living landscape belonged to a geologic period, too, and already showed signs of slipping into the past. For suburban developments were encroaching on my woods; metropolitan skylines loomed not far away.

Against all this the resentment of the wilds was as futile as my own. Even the watchful hawk, which sometimes perched on the topmost branch of a towering dead tree or rose to wheel in widening circles against the sky—even he, the self-appointed guardian of this hill-top world, now found his threats without avail. Another enemy had appeared, one who owed him and his kind no fear, and the wilds no true allegiance. These woods were laid low, and became one with the forgotten past.

Paved streets displaced the hillside trails; trim houses were set in door-yards where once the oak trees towered; and a new generation of men were altogether ignorant of that former reign of hawk and owl. Even the gray squirrels found their former security destroyed, and became town dwellers. The same held true for that secretive bird, the blue jay. Its brilliant azure wings now flashed along our populous avenues where her shrill screaming cry recalled those earlier days when she lived beside the pond.

The winding aisles of the Long Island woods—the tuliptrees, chestnuts, hickories, walnuts and dogwoods that once clothed the backbone of the hills

Long before this occurred, however, certain other creatures had become half-domesticated and lived beneath my very roof. Our house cat knew it even when she dozed beside the kitchen fire. Those faint scratchings behind the plaster walls —what were they but sly foragings of hidden mice? Only when they broke into excited squeaks did the cat twitch her ear, and half-open an inquiring eye. But when a puff of wind-blown ashes flew outward from the fire she awoke to startled attention. The North Wind's great presence seemed to fill the room.

Later, the winter nights grew colder until the cat could not fail to listen, as did we, to a rattling uproar beneath the roof. Those mischievous mice had discovered the sporting possibilities in black walnuts we had gathered in autumn, and left to dry on the garret floor. Long before the days of Mickey Mouse, these midnight roisterers made such antic holiday we could almost imagine the scrimmage, end-play and final touchdown as those pattering feet chased the bounding walnut balls along the garret floor.

On nights like these we crept into bed and drew the covers close, only to listen in the darkness. If the night was still, we could hear the sounds of riverboats from far away to the northward as they

(*Turn to page* 511)

SPECIALTY FOREST

When Rare Length Timbers Are Needed in Ela Valley, the Peper Brothers Supply Them

By FRED TRENK

IN a community that for nearly a century has been working over the remaining farm woods for the best trees, the Peper brothers of Loganville, Wisconsin, have found that the more rare the tall trees in their neighbors' woods become, the more profitably they can market the tall ones in their own. A bridge builder calls for bids for piling. When the Peper brothers win the bid, the easy-to-find lengths are purchased from their neighbors; their own woods supply the rare lengths. Much of the lumber bill for a barn can be cut from short logs, of which the neighbors have plenty. But now and then blueprints call for a long timber the neighbors' woods can't supply. The Pepers can—and do. They are entitled to, and get, the premium price that attaches to the rare article.

Here literally is a reservoir for timber specialties, where rarely is anything cut that is common.

The Ela Valley, incorporated in the name chosen by the Peper brothers to designate the logging and lumbering enterprises on their farm, is a soft crease in the limestone upland that lays as a shroud over the long-buried quartzite at the western end of the celebrated Baraboo range. Long, gentle slopes and deep soil have made possible an ideal proportion of cropland and timberland on the 600 acre farm, with 230 acres reserved to produce a steady supply of those choice and essential items always necessary to complete the lumber bill for any home or fully equipped barn.

This Ela Valley farm has been home for William, Albert and August Peper for fifty years. As much as any family ever can, they have become an institution in their community. The five sons of William—two now in military service—and the seven sons of August assure ample future manpower on a farm, the principal products of which have long been hogs, beef and dairy products. There are daughters, too, to carry on the job of homemaking. All live and work together as one large family.

An artificial pond for ice and the sawmill are the center of community services rendered by the Peper brothers, providing a source of income to the family. A private park in a wooded glade, where families and community organizations are ever welcome for picnics, is a good-will service to which a price tag is never attached.

A few days before Pearl Harbor the Peper brothers were hosts to 250 neighboring farmers in celebrating twenty-five years of custom sawmill service to the community. A feature of that anniversary celebration was a logging demonstration arranged for by David Williams, county agricultural agent.

A mature white oak, twenty-eight

Although providing custom sawmill service for more than a quarter century, main feature of the Peper mill is that it is equipped to handle the large timbers grown in the specialty forest

William, Albert and August Peper, who make a specialty of growing high-quality timber for use in their Wisconsin community, maintain 230 acres of productive forest on their 600-acre farm

inches in diameter, and leaning about thirty-five degrees from perpendicular, was selected for felling. Every farmer with woods experience—and few in the Baraboo range are inexperienced—recognized it to be a tree most difficult to drop without splitting the butt log, or without leaving a "barber-chair" stump. To the Pepers it was an opportunity to give a few tips to their neighbors on how to avoid breakage in the choice log of the tree. And they had good reason. Too many split logs had been coming to them in the custom jobs.

Contrary to standard practices, the tree was not notched. A cut was made by Albert and August with a narrow "ribbon" saw on the side of the tree facing the direction of the lean, or fall. As soon as it was deep enough, William applied a maul to felling wedges driven in back of the saw. Four of these kept the tree from pinching the saw. Once past the center of the tree all danger of pinching ceased, and the saw cut was carried to within two inches of the opposite side. Then the saw was removed, and a few swift strokes with William's sharp ax severed the remaining fibres. The heavy leaning oak fell without trace of split or splinter.

Since dirt-encrusted logs are the bane of every custom sawyer, the Pepers then demonstrated a homemade travois or log sled. Not only did this keep logs clean, but the smoothly-worn runners made it possible to skid several logs at a time with less power. Farmers quickly observed, too, that the travois was a gully preventer when used for logging on hillsides.

To most of the anniversary guests, the sawmill sheltered in an old cheese factory and powered with steam was a familiar place. Few there were who have never, during the preceding quarter of a century, taken lumber from this mill, or from the planer nearby. During the first ten years of sawmilling the Pepers cut 1,000,000 board feet of logs from their own woods to match an equal amount brought in by farmers for custom sawing. Then they realized the wisdom of reserving high-quality trees in their own woods to furnish specialized cuts, encouraging their neighbors to supply a higher percentage of the lumber used on the farms in Ela Valley. For the past eighteen years the home cut has been held to around 50,000 feet annually of high-quality timber, while the custom jobs have totaled as much as 1,000,000 feet a year.

A jointer and a bolter make possible the production of finished lumber for interior and exterior work. More than one home in the Ela Valley has floors and trims of oak finished at the Peper mill. But the feature of the mill remains as it has been ever since operations began—the sawing of large timbers. A long log carriage and an extended section of carriage tracks enable the Peper brothers to handle logs thirty-six feet long.

The sylvan park, developed and maintained by a family that senses the need for something more in a community than material wealth, is a popular summertime spot in Ela Valley. The American Legion, organized farm associations, the local church and labor groups are annual users of the park. The Pepers have long since ceased to keep a record of the families who have used it privately for reunions.

A prized remembrance of the twenty-fifth sawmill anniversary is an ax finished in silver, presented by friends of the Pepers. It was by no means a solemn occasion when the ax was given to the brothers. In fact, the speaker wove considerable levity into his presentation speech, which was what the Pepers most enjoyed. They want neighbors who will laugh with them. It is enduring proof that the service they give is appreciated and that the objectives they are working for are understood.

GEORGE W. NORRIS
1861-1944

GEORGE W. NORRIS—GREAT LEADER OF CONSERVATION

By RAPHAEL ZON

THE activities of Senator George W. Norris during the fifty years of his publice service covered such a wide range and touched human life from so many different angles that it is impossible to compress within a brief sketch a life so rich in human sympathies and replete with struggles for the rights of the common man.

Although he came from a plains state, Nebraska, almost treeless and poorly endowed with potentialities for waterpower development, he became the outstanding leader in fundamental legislation for the preservation and development of the country's natural resources. The conservation laws which he sponsored and helped to pass, opened new possibilities never thought of before. He was a firm believer in the importance of the national forest system and the part which it played in a planned land use, and more than once he came to defense of that system in time of need.

Brought up on the western plains, it was only natural that he should be concerned with the use and the preservation of the natural range. It was he who introduced a resolution, adopted by the Senate, which requested the Department of Agriculture to report to the Senate on the condition of the range resource and make recommendations as to the constructive measures for its improvement. It was also he who was instrumental in making this valuable report, entitled "The Western Range," appear as a Senate Document.

Tree planting in the Plains Region has been a vital necessity since early settlement. Yet strangely enough, when the plan for shelterbelt planting on a large scale was first proposed, Norris was somewhat skeptical about it. He was afraid that it should prove a fiasco similar to the Timber Culture Act. As a young, struggling lawyer in McCook County he observed at close range the slipshod methods, the false pretense, and actual fraud connected with the operation of that early act. Later on, however, when he became more familiar with the plan itself and observed its operation on the ground and learned to respect the integrity and competence of the foresters who were supervising the work, he became an ardent supporter of the shelterbelt planting project and fought many hard battles in defense of it.

His sympathies were always with the small common man. He was concerned with the preservation not only of the large forest areas but even more deeply with the small farmer's woodlot. He became the sponsor and the author of the farm forestry act (Norris-Doxey Act). This act constitutes an important milestone in our forest progress. It has opened the way for dealing with all forestry problems in a specific locality in a coordinated way. It proved more effective in getting good forest practice in the woods and in obtaining a higher value for the farmers' timber than any of the educational devices or other methods of public aid which had previously been tried. It has proved especially valuable during the war when the demand for woodlot timber has enormously increased, and with it the danger to the future of the woodlot itself.

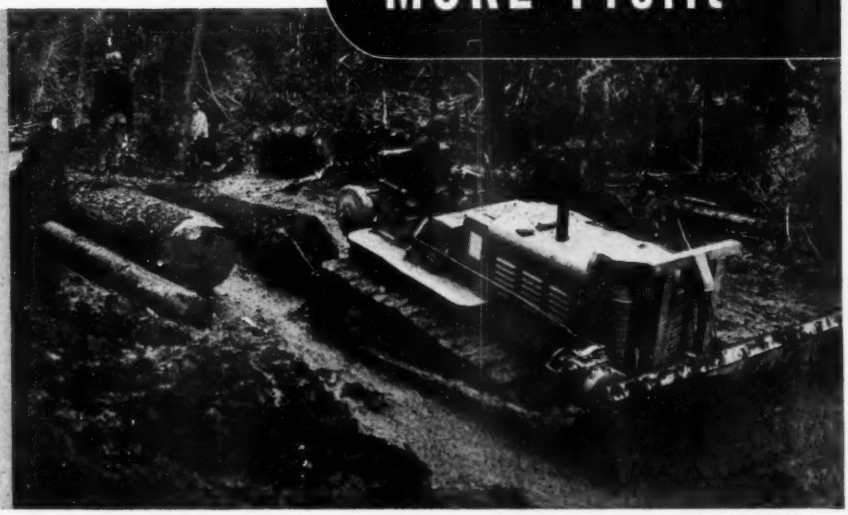
Senator Norris's greatest contribution, however, lies in the orderly development of waterpower in this country. Much of the legislation which he sponsored and succeeded in passing, is really basic to the whole conservation movement. It loosed an entirely novel idea of unified development of a river valley. The Tennessee Valley Authority is Norris's monument. The great social value of the Tennessee Valley project lies not so much in the fact that it prevented the disposal for a mere song of a valuable public property, the Muscle Shoals; nor even in the fact that the enterprise became a great source of power and a "yardstick" for controlling electric power rates; its greatest value lies in the fact that it served as a spearhead for an entirely new concept of full utilization of regional natural resources. It put into practice an integrated system of multiple-purpose dams to regulate and control the entire river. The TVA proved that it is possible to develop a river serving simultaneously as a source of power, flood control, navigation and irrigation, and also as a means of soil conservation, permanent forestry, and development of a multitude of industries throughout the river valley through abundant and cheap electric energy. The TVA project is now past its experimental stage. It passed the test of its practicability with flying colors and has become an example for other similar developments. Norris Dam

(*Turn to page* 500)

*Tru-Traction** means MORE Traction FASTER Work MORE Profit

*Tru-Traction is power on BOTH tracks at ALL times—and you get it only with

CLETRAC TRACTORS



WHEN post-war *planning* is converted into ACTION, much will depend on the equipment you have for the big jobs ahead. Power and traction will be most important.

For ordinary jobs of earth moving, bulldozing and hauling, any equipment may suffice, but when the going is tough and competition is keen, the advantage is with the contractor who is equipped with Cletrac power and traction.

There is a good reason why the use of the Cletrac Tru-Traction principle of power on both tracks at all times has been applied to all high-speed full tracklaying military vehicles. The effectiveness of this principle (Controlled Differential Steering) has been proved over and over again, in mud and muck, over rocks and hills, the world over. This Tru-Traction principle is exclusively a Cletrac development and used solely in Cletrac Tractors for more than 25 years. It is a principle that will earn dividends for contractors whose profits depend upon power, traction, and economy of operation.

Prepare now for postwar needs. Write today for complete information about Cletrac Tractors, including the new booklet "In War and Peace Cletracs Do the World's Work."

AVAILABLE for Essential Civilian Use

While Cletrac is still producing to meet the demands of war with a large part of its standard tractor production required to meet present military contracts, over-all production of Cletracs is sufficiently large so that a substantial number of Cletracs are being released for essential civilian use. These tractors are allocated according to government regulations. Your Cletrac dealer will gladly assist you in making application for a new Cletrac if you can qualify as an essential user.

Write for booklet "In War and Peace Cletracs Do the World's Work"

THE CLEVELAND TRACTOR COMPANY • 19300 EUCLID AVE., CLEVELAND 17, OHIO

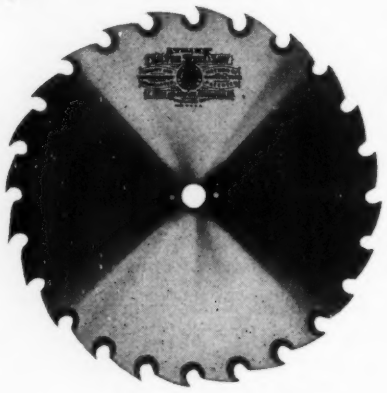
CLETRAC *Tru-Traction* TRACTORS

GASOLINE OR DIESEL

ATKINS

INSERTED TOOTH CIRCULAR SAWS

LOW COST, HIGH SPEED CUTTING The Year Around



● For a saw that will give you exceptional service the year 'round—that will handle very hard or gritty timber—Atkins Inserted Tooth Circular Saws are unexcelled. Blades of tough, strong, tension—holding Silver Steel; accurately milled tooth sockets; finest quality inserted teeth are the combination that spell "economical sawing". Available with various types of inserted teeth and holders for different kinds of work. Full information is available on request.

Send for Mill Saw Catalog.

E. C. ATKINS AND COMPANY
413 S. Illinois St., Indianapolis 9, Indiana

Agents or Dealers in All Principal Cities the World Over

Silver Steel SAWS

AFA Elections Committee Named

THE following members have been named by the Board of Directors of The American Forestry Association to serve as the Committee on Elections to nominate officers of the Association for 1945:

Shirley W. Allen, School of Forestry and Conservation, University of Michigan, chairman; Karl T. Frederick, Chairman of the Board, New York State Conservation Council; and Fred Morrell, the American Paper and Pulp Association.

Officers to be elected in 1945 will include the president, twenty-one vice-presidents, the treasurer and three directors. The directors to be elected—to serve five years—will fill positions now held by Goodwin B. Beach of Connecticut, L. F. Livingston of Delaware, and Randolph G. Pack of New York.

Though the Committee on Elections will nominate a slate, the By-Laws of the Association entitle members to make nominations if they wish, independent of those made by the Committee, for any of the offices to be filled. The By-Laws provide that such independent nominations must be signed by not less than twenty-five members of the Association in good standing and such independent nominations must reach the Committee on Elections at 919 Seventeenth Street, Northwest, Washington 6, D. C., the headquarters of the Association, not later than November 1, 1944. The slate, with any independent nominations made by the membership, will be offered for letter-ballot vote to the members of the Association during the month of December, 1944.

Jackson Hole Court Decision Postponed

DECISION in the State of Wyoming's suit challenging the validity of a 1943 presidential proclamation creating the 220,000-acre Jackson Hole National Monument was postponed by Judge T. Blake Kennedy in the Federal District Court at Sheridan, Wyoming, at the conclusion of hearings on August 24. Counsel for both sides were allowed until December 1 to prepare and submit briefs, which probably means that a decision will not be rendered before early next year.

The court was asked by the state to interpret the Antiquities Act of 1906, under which the monument was created, and rule on the validity of the presidential proclamation. It was further asked to restrain the National Park Service from assuming administration and jurisdiction of the monument. The state's case, presented by fifteen witnesses, was based on the proposition that the creation of the monument was a device to extend the Grand Teton National Park and that the area contains no outstanding historic or scientific objects as contemplated by the Antiquities Act.

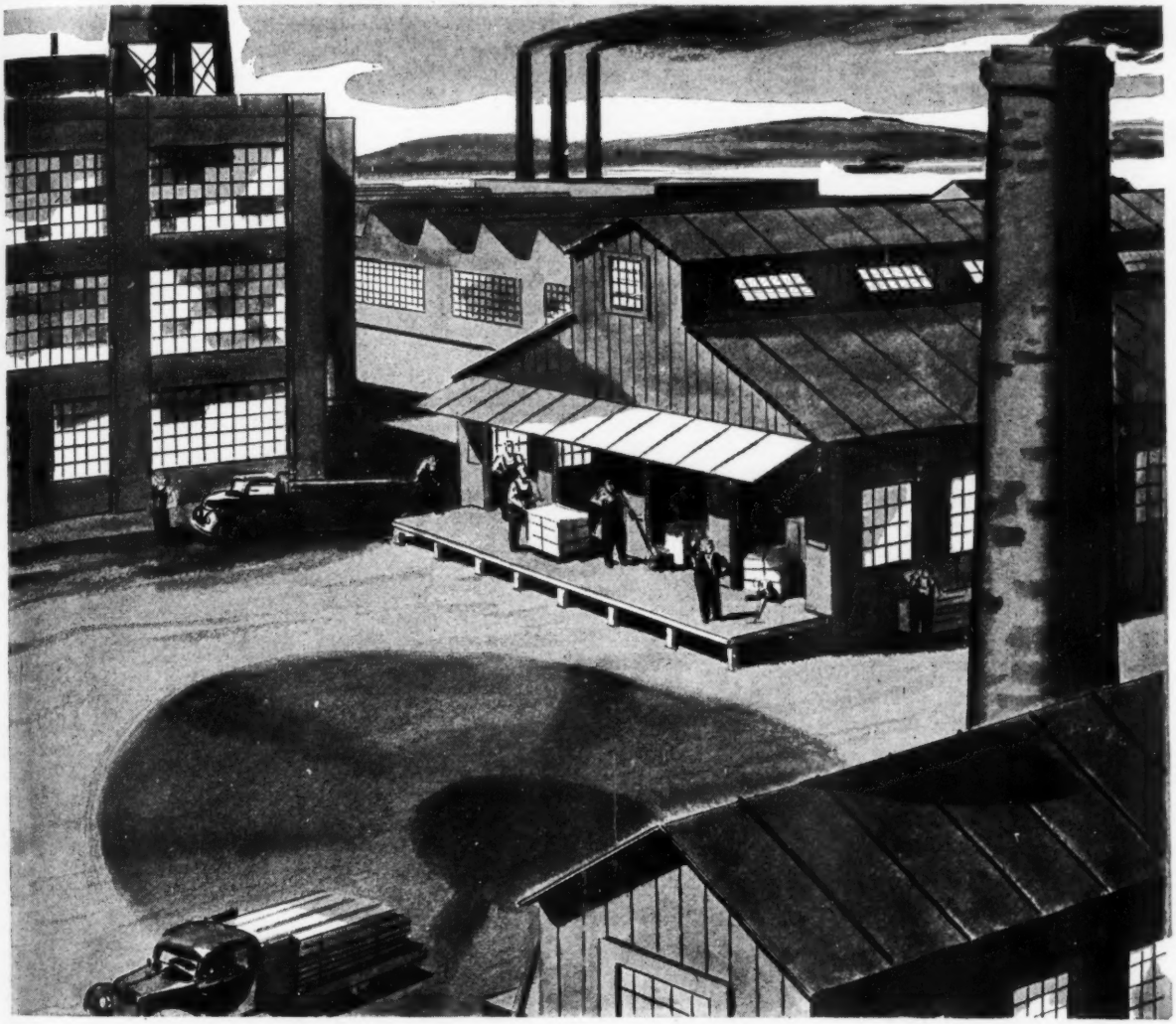
Testifying for the state, Lester Baggley, Wyoming Fish and Game Commissioner, stated that administration of the area as a national monument would render difficult the handling of the Jackson Hole elk herd, numbering around 15,000 animals, by state authorities because of possible interference with established practices. Joseph Weppner, secretary of the Wyoming Historical Landmarks Commission, testified that, in his opinion, the Jackson Hole Monument contained nothing of historical significance. The Commission's chairman, Warren Richardson, supported these views. State geologists testified that all of the geologic phenomena in the area are duplicated elsewhere in the state in a number of places.

The government countered with testimony by Dr. Olaus Murie, biologist of the Fish and Wildlife Service, that the monument area is unique and of outstanding biological interest in that it is a natural area containing more than 120 species of birds, forty species of mammals, and many plants; that the area is an important one from an ecological point of view in the study of life zones; and that the monument area contains the natural migratory trail of the Jackson Hole elk herd, which is of outstanding biological interest. Dr. Harold E. Anthony of the American Museum of Natural History testified that the area contains many objects of interest to scientists and students of natural history.

Merrill Mattes, custodian of Scotts Bluff National Monument, testified as to the historical significance of the Rocky Mountain fur trapping era and the relationship of the Jackson Hole Monument to this era. As to the geological features of the area, Dr. Leland Horberg, professor of geology at the University of Illinois, and other geologists, testified that the monument is unique in that it contains within a small area outstanding examples of moraines and outwash plains.

The government stated that no action as yet had been taken to administer the Jackson Hole Monument area as a national monument.

★ NUMBER 12 IN A SERIES OF MESSAGES BY KELLETT AIRCRAFT CORPORATION ★



THERE'S SOMETHING IN THE AIR . . .

THE SHADOWS of slowly descending helicopters will be a frequent sight in the peacetime years to come . . . but only after the war will you learn *all* of the progress in design and the engineering improvements that have *already* taken place. Today's "in the air" performance of several successful helicopter types is known only to the Military Services . . . but in the tomorrows to come it is likely that the ability of helicopters to land and take off vertically . . . to fly rapidly or hover in the air . . . will find many commercial, personal and industrial uses. The patrolling of forest areas and ranches, the inspection of cross-country power and pipe lines, spraying crops, servicing inaccessible places far from airports, are just a few of many useful applications of the helicopter. Kellett's expanding engineering staff looks with anticipation to the future . . . when modern helicopters will bring you one of the most progressive developments to come out of this war. Kellett Aircraft Corporation, Upper Darby (Philadelphia), Pa.

KELLETT

OLDEST ROTARY WING AIRCRAFT MANUFACTURING COMPANY

AMERICAN-MARSH PUMPS

Simplex Pumps

FOR

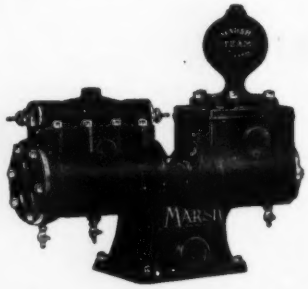
BOILER FEED

AND

GENERAL SERVICE

AMERICAN-MARSH Simplex, Piston Packed Steam Pumps embody those features which more than seventy years of experience have proved essential to low operating and maintenance costs. The design offers mechanical simplicity; and the construction, from the standpoint of ruggedness, is unsurpassed. Sizes suitable for feeding boilers up to 5600 HP.

Send for Bulletin 201-AF



Type shown is particularly adapted to logging installations up to 110 boiler horsepower.

AMERICAN-MARSH PUMPS, Incorporated

BATTLE CREEK, MICHIGAN

CONSERVATION CALENDAR

Important Bills in Congress With Action
June 5-September 18, 1944

Bills Enacted

H. R. 4278—PACE—To provide for the control and eradication of certain animal and plant pests and diseases, to facilitate cooperation with the states in fire control, to provide for the more efficient protection and management of the national forests, to facilitate the carrying out of agricultural conservation and related agricultural programs, to facilitate the operation of the Farm Credit Administration and the Rural Electrification Administration, to aid in the orderly marketing of agricultural commodities, etc. Amended and passed by the House March 7, 1944. Amended and passed by the Senate May 1, 1944. In conference May 3, 1944. Presented to the President for signature September 18, 1944.

H. R. 4443—TARVER—Making appropriations for the Department of Agriculture for the fiscal year ending June 30, 1945. Passed House March 24, 1944. Amended and passed by the Senate May 17, 1944. Conference Report agreed to June 22, 1944. Approved by the President June 28, 1944. Public Law No. 367.

H. R. 4679—JOHNSON, Oklahoma—making appropriations for the Department of the Interior for the fiscal year ending June 30, 1945. Passed House April 27, 1944. Amended and passed by the Senate May 23, 1944. Conference Report agreed to June 21, 1944. Approved by the President June 28, 1944. Public Law No. 369.

H. R. 3524—RANDOLPH—To provide establishment of the Harpers Ferry National Monument. Passed House April 17, 1944. Passed Senate June 22, 1944. Approved by the President June 30, 1944. Public Law No. 386.

Conservation

H. R. 4992—MILLS—To provide for making certain surplus materials, equipment and supplies available for soil and water conservation work through the distribution thereof, by grant or loan, to public bodies organized under state laws. Introduced June 9, 1944. Referred to the Committee on Agriculture.

Governmental Functions

H. R. 5125 — COLMER (S. 2065 — STEWART)—To provide for the disposal of surplus government property and plants. Amended and passed by the House August 22, 1944, but with text of S. 2065 substituted by the Senate. H. R. 5125 passed the Senate August 25, 1944. In conference August 28, 1944. Conference Report (No. 1890) agreed to in the House September 18, 1944.

Grazing

H. R. 5058—ENGLE, California—To provide for the issuance of grazing permits for livestock in the national parks and national monuments. Introduced June 19, 1944. Referred to the Committee on the Public Lands.

Payments-to-States

H. R. 5121—PETERSON, Florida—To authorize the participation of states in certain revenues from national parks, national monuments, and other areas under the administrative jurisdiction of the National Park Service. Introduced June 23, 1944. Referred to the Committee on the Public Lands.

Public Lands

S. 1982 — CORDON (H. R. 4986) — ELLSWORTH)—To reopen the revested Oregon and California Railroad and reconveyed Coos Bay Wagon Road grant lands to exploration, location, entry and disposition under the general mining laws. Introduced June 7, 1944. Referred to the Committee on Public Lands and Surveys.

Research

H. R. 5279—FULMER—To provide for the establishment and operation of forest products pilot plants. Introduced August 31, 1944. Referred to the Committee on Agriculture.

Water and Stream Control

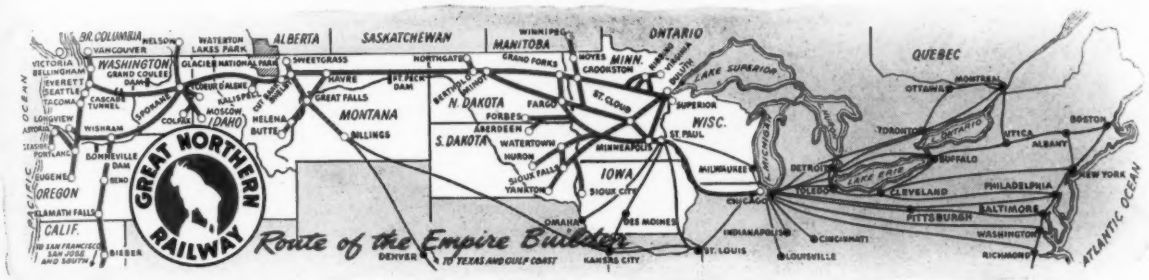
S. 1989—BARKLEY—To provide for water-pollution-control activities in the United States Public Health Service. Introduced June 8, 1944. Referred to the Committee on Commerce.

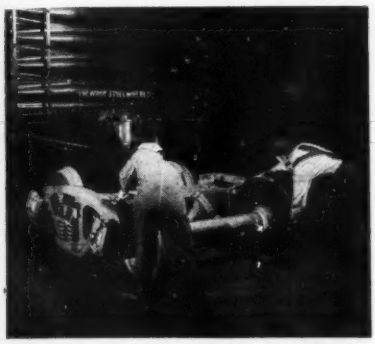
S. 2089—MURRAY—To establish a Missouri Valley Authority to provide for unified water control and resource development on the Missouri River and surrounding region in the interest of the control and prevention of floods, the promotion of navigation and reclamation of the public lands, the strengthening of the national defense, etc. Introduced August 18, 1944. Referred to the Committee on Agriculture and Forestry.

H. R. 4485—WHITTINGTON—Authorizing the construction of certain public works on rivers and harbors for flood control. Amended and passed by the House May 9, 1944. Reported with amendments (No. 1030) by the Senate Committee on Commerce June 22, 1944.

GREAT NORTHERN RAILWAY

BETWEEN GREAT LAKES AND PACIFIC





High-speed trucks, equipped with non-harmonic springs and steel wheels, are placed under framework. Car ends are steel.

LIGHTER, FASTER FREIGHT CARS OF PLYWOOD, STEEL AND LUMBER

Combination of Materials Results in Sturdiness, Less Weight

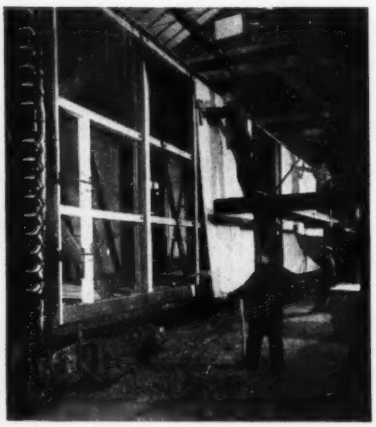
Construction of the American railroad industry's first plywood-steel freight cars is under way by Great Northern Railway in its own shops.

Another symbol of progressiveness—*one of the many things which make Great Northern great*—1,000 of these new, bright orange-painted freight cars will be in wartime transportation service before Winter.

Developed by company technicians, the modern, 50-ton capacity cars are a combination of steel, Douglas fir plywood and lumber.

Lighter-than-conventional steel was utilized for underframes, while lumber and steel form the superstructures. Outside and inside sheathings, including ceilings, are of ⅝-inch plywood. To prevent warping, the plywood is treated with a "sealer."

Two tons lighter than the conventional boxcar, the plywood-steel units roll faster because of high-speed trucks, non-harmonic springs and wrought steel wheels. Steel ends and metal roofs add to sturdiness.



Sheathings of ⅝-inch Douglas fir plywood are placed outside and inside steel and lumber superstructure.

Interiors are sprayed with varnish. The plywood first is treated with a "sealer" to prevent warping.

Plywood panels are bolted and nailed to superstructure of steel and lumber.

Powered by G. N.'s newest 5,400-horsepower diesel locomotives, a 100-car train of plywood-steel cars approaches Glacier National Park en route to the Pacific Northwest.

"Dublin" Shape #08

The Flavor of Home

If you aren't smoking a pipe now, may we suggest that you try a Kaywoodie? There's an advantage, when you start doing anything, in having the very best with which to do it, and that's just what Kaywoodie provides for you. And there are three good rules to follow, if you wish to begin smoking a pipe: (1) fill it only half full, for a while (2) smoke it *very* slowly (3) keep it clean.—If you've been unable to find Kaywoodies lately, it's because these pipes are in great demand by men in the Armed Forces. We're sure you'll agree that we must serve our fighters, first! Kaywoodie Company, New York and London. *630 Fifth Avenue, New York 20, N. Y.*

George W. Norris—Conservation Leader

(*From page* 494)

on the Clinch River is now one of the TVA's key units, although the Senator declined to attend the dedication of a bust of himself at the site of the project.

When in 1940 Senator Norris stood at Grand Coulee Dam there were tears in his eyes as he looked down at the great dam—the largest power project on earth. "This is the fulfillment of my dream," he said, remembering undoubtedly those days when he fought alone for government development of America's rivers. What the President said in his original TVA message in 1933 has now become a reality. "If we are successful here," he said, "we can march on step by step in the like development of other great territorial units within our borders." The TVA idea is now on the march.

There is a great popular clamor today for applying the TVA idea to the Missouri Valley, with its 500,000 square miles of watershed and 2,500 miles of the Missouri River, from its main source at the continental divide to the point where it flows into the Mississippi fifteen miles above St. Louis. George W. Norris, speaking from McCook, Nebraska, with regard to the MVA, gave the project his blessing with a statesman's paternal pride in TVA. "All the Missouri Valley has to do," he said, "is simply to see what has been done in the Tennessee Valley."

What is this Tennessee Valley idea? According to Lilienthal, the author of a recent book, "TVA—Democracy on the March," it is the application of the managerial principle to river problems:

1. A federal autonomous agency, with authority to make decisions in the region.

2. Responsibility to deal with resources as a unified whole clearly fixed in the regional agency, not divided among several centralized federal agencies.

3. A policy, fixed by law, that the federal regional agency will work cooperatively with and through local and state agencies.

Senator Norris is dead, but his idea of integrated development of river valleys is marching on.

There are many stories about the simplicity and the democratic habits of Senator Norris. He not only preached democracy—he lived democracy. Once he confessed, while sitting in a little restaurant in Nebraska, that he still could not overcome the habit when looking over a menu, first to glance at the prices. He avoided all pomp and ostentation. He had no chauffeur, he and his wife often stopped at tourist homes and boarding houses on their way between Nebraska and Washington, and once on a field trip in northern Minnesota he acted as the chauffeur for a group of foresters who accompanied him during a visit of a Senate Committe to study control of lake levels in connection with waterpower development.

George Norris fought and never quit fighting for the common person and the best interests of humanity in his long career. All who knew him believed his statement, "My lips have never told a lie and my hands have never touched a bribe."

The Anthracite Region

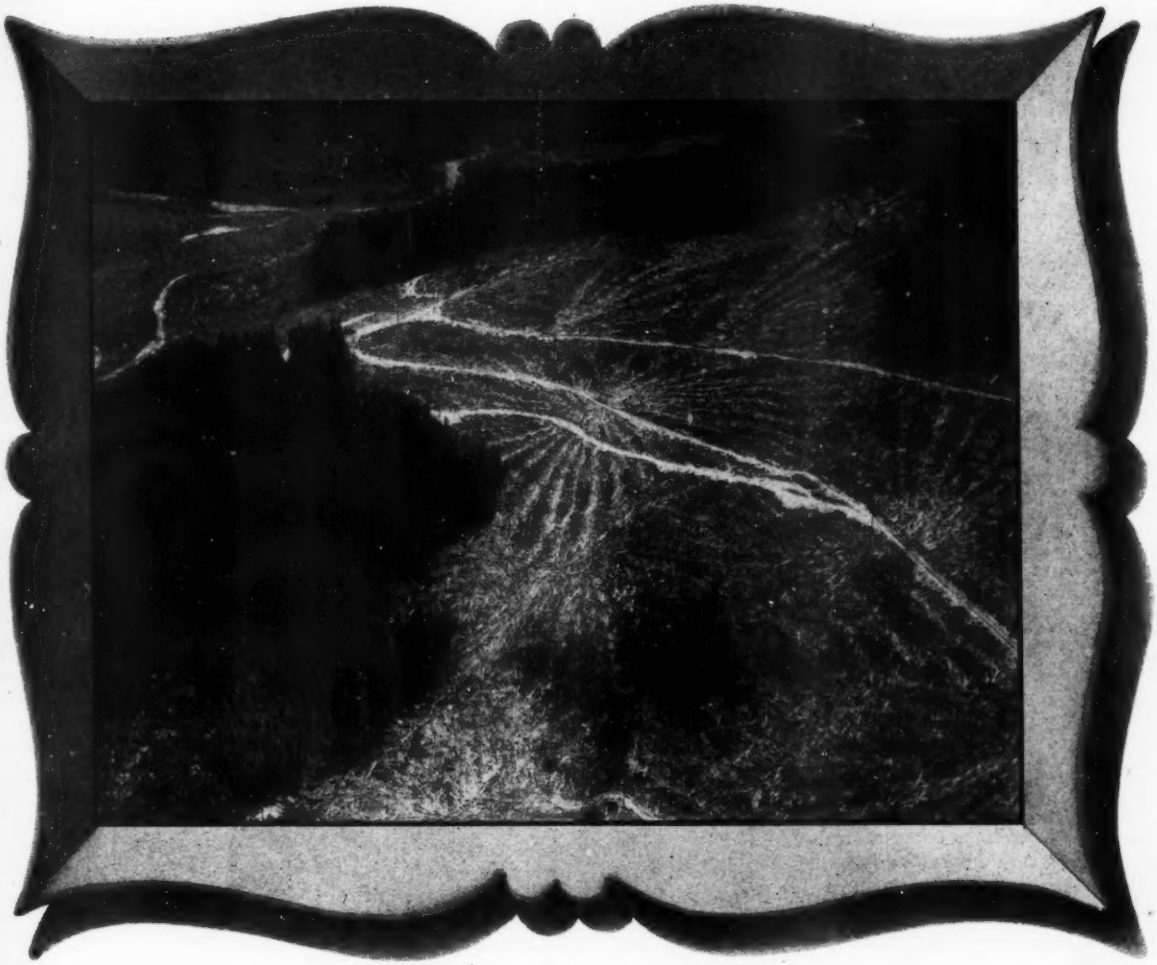
(*From page* 488)

least 3,000.

So far only the Luzerne County report has been issued. The final step should be a regional report, telling explicitly how many permanent, yearlong jobs the forests of the region could furnish if they were intelligently handled under a regional plan.

Whatever the details, the regional plan, and so far as possible the county plans, must deal squarely with the fact that cutting the forest clear as soon as it has produced mine props is fatal to any hope of substantial employment both in the forest and in wood-using industries. The region can fully supply the demand of the mines for lagging and props and at the same time reserve a supply of larger trees for handle factories, furniture plants, and similar industries. These, not sawmills or prop-cutting, are the industries which can employ the largest numbers of skilled wood-workers. Thinning, rather than clear-cutting, of immature stands must be the method for supplying the mines.

To accomplish this, it is necessary to work either through the landowners, or through the public, or both. If the people of the region, or even of a single county, are once convinced that present methods of handling the forest resource have depleted the forests and prevented their becoming a source of employment on a real scale, they can remedy the situation. Pennsylvania's excellent and comprehensive zoning laws, under which the public can control private lands, might be one means of accomplishment. Federal or state regulation of timber cutting on private lands would be another, but successful admin-



REFORESTATION ON THE WEST COAST

Good Forestry demands different systems of management for New England, the Lake States, the South, and the West. Hardwoods, pines and firs all grow best when managed according to their own particular needs.

The magnificent Douglas Fir forests of the West Coast reproduce themselves best when harvested under some variation of controlled clear cutting. The young growing Douglas Fir trees must have plenty of light.

A recently cut area of Douglas Fir with the slash burned to clear the land of debris and reduce the fire hazard, is a sorry sight. But just be patient and wait a few years until the seed blocks like those shown above have spread their seeds that cover the ground with a dark green carpet of young growing trees. That is a sight to renew one's faith in the value of man's cooperation with nature. And that is exactly what is happening on the Pacific Coast of Oregon and Washington.

Between 1933 and 1943 in 21 counties of Oregon and Washington covered by a survey and resurvey of forest conditions made by the U. S. Forest Service, the acreage of mature saw timber was reduced by cutting 713,800 acres. In 1943 in the same counties 763,800 more acres were found to be restocked to seedling and sapling trees than was the case in 1933. This increase of reforested lands is the result of better fire protection and cutting methods.

West Coast lumbermen are making steady progress in their efforts to keep their forest lands productive and, as a result, expect to maintain a permanent and prosperous forest industry.

WEYERHAEUSER

istration will certainly have to depend on some form of localized authority. The Soil Conservation Districts Act might be adapted to forestry objectives here.

The second alternative is to work through the forest landowners. Without their consent, no sawmill or prop operator can cut the forest clean. Most owners permit or even insist on clear cutting because they do not realize that any other kind of cutting is possible, or at least profitable. That even thirty forest owners have, in the last few months, decided to save their immature timber, while cutting the mature, is proof that forestry is finally rooting itself in the woods of the anthracite region. Luzerne County and Stanley Mesavage are showing the way.

In 1941 Mesavage suggested to the Wyoming Valley Chamber of Commerce a plan he had long cherished for an industrial forestry division. His appointment to take charge of the newly-created division followed.

The Industrial Forestry Division operates under a simple plan. To command its services, a forest landowner has only to take out a special membership in the Chamber, costing $10 a year to individuals, and somewhat more to organizations. For this fee the member obtains the services of one of the Chamber's foresters (Mesavage now has an assistant) in cruising his timber, blazing the trees ripe for cutting under good forest management, actual sale of the blazed trees, and supervision of the cutting to preserve the uncut trees and young growth. This closely follows the services rendered in recent years to citizens of New Jersey by the State Forest Service, of whose work Mesavage is a close student.

In 1942 Luzerne County, on the basis of a substantial contribution to the funds of the Industrial Forestry Division, employed Mesavage to examine its holdings of tax-delinquent forest lands and to recommend county action. As a result some were turned over to the State Game Commission, whose property they adjoined. A few were sold to citizens who were interested in holding them and maintaining them in good productive condition. About 6,500 acres are suitable for county forests, and under Division plans may be inexpensively administered as public recreation grounds or for wood production. Final declaration of the county forests is pending.

Further impetus to actual work in the woods in the anthracite forest region was given by the United States Forest Service when it created a forest farming project there, with headquarters in the office of the Chamber of Commerce at Wilkes-Barre. The project forester and the Chamber's men work in closest collaboration. In addition to all his other duties, Mesavage is fire warden for the State Department of Forests and Waters in the Wyoming Valley, so that coordination of all public or semi-public forestry activities is assured.

The Anthracite Economic Survey will continue its work for at least the present fiscal year. The problems of the region are far from being entirely solved. Even the major one of how to prevent clear cutting of immature timber on private land has been approached from but one direction—the owner's enlightened interest in his own property. Yet the developments of the past ten years, following the discouragements and set-backs of the depression years, cannot but encourage those who have ceased to look for miracles of forest progress.

Every forester knows that without local understanding and sympathy he cannot effectively build up the resources of even a few thousand acres. The significant fact about the present-day situation in the anthracite area is that local organizations and local men and women have glimpsed the vision of a forest resource rehabilitated and developed to its full usefulness. They have not hesitated to borrow the services of those outside their region, and to seek light wherever it might be found. But their main reliance is on institutions of their own devising, and on the most intimate knowledge of their own needs.

Heat With Wood

Enjoy 24-hour continuous controlled heat. No fires to build daily. No ashes to remove daily.

Install an

ASHLEY

Patented (five patents) thermostatically controlled downdraft woodburning home heater.

BURN WOOD
It's Not Rationed

Refuel at night and in morning. Remove ashes on average once every 10 days. Burns worthless hardwood trees.

Ashley users state they save 50% to 75% on fuel cost, enjoy 24-hour heat, more heat, cleaner heat. Let us mail you photostatic copies of these unusual letters.

Over 2,000 Ashleys retailed in one town and trading area—they must be good.

8 types and prices to suit the humblest shack or the finest home.

$34.95 to $49.95. If no dealer near you, we ship direct, freight prepaid.

Write for catalog, prices. Send Stove certificate.

Unit to supply hot water 24 hours a day can be installed.

Ashley Automatic Wood Stove Co.
Dept. A Columbia, S. C.

"School-at-Home"
KINDERGARTEN THROUGH 9TH GRADE

This famous school will give your child sound, modern schooling wherever you may live. Courses widely used by Forestry Service families. Step-by-step guidance for parent. No teaching experience needed. Daily lessons, books and materials provided. Start any time. Catalog on request.

CALVERT SCHOOL
1610W Tuscany Road, Baltimore 10, Md.

FOR INVENTORS INVENTION RECORD HERE

Write today for valuable 72-page booklet, "How to Get Your Patent" and "Record of Invention" form—both free.
L. F. RANDOLPH, 586 Columbian Bldg., Washington, D. C.

Cant Hooks

Bull Dog Grabs

Forged Steel Swivels

Peavies

Single and Double-Bit Axes—all patterns and weights.
Buy from your dealer, but if he cannot supply you, write us.

WARREN AXE & TOOL CO., Warren, Penna.

SAGER AXES AND BULL DOG LOGGING TOOLS—KNOWN FROM COAST TO COAST

Consult your "Caterpillar" Tractor Dealer . . .

He'll give you the right answers

When you want dependable, up-to-the-minute information about tractors, call on your "Caterpillar" tractor dealer. When you want to talk about HYSTER tractor equipment, ask him, too; all **"Caterpillar" dealers are also HYSTER dealers.**

Ask him . . . specifically, about the line of HYSTER Towing Winches and Donkey Double Drums . . . and the powerful, HYSTER Utility and Worm Drive Winches that are making records in heavy contracting work and oil field service. Indispensable equipment for any tractor—but designed and built especially for "Caterpillars." If you're a logger, look into the line of husky, HYSTER Arches and Sulkies.

Whatever the question, if it concerns tractors or tractor equipment—see your reliable "Caterpillar" dealer . . . or write for information.

LARGEST MANUFACTURER OF TRACTOR HOISTS & WINCHES

★

Sold and Serviced by "Caterpillar" Dealers Everywhere.

HYSTER Company

2972 N. E. Clackamas Street
PORTLAND 8, OREGON

1872 North Adams Street
PEORIA 1, ILLINOIS

"The Strongest Geared Power for its Weight in the World"

Two Speeds
Positive Internal Brakes

COMPACT
POWERFUL
SAFE

For Use Where Power is Not Practical, Available, or Sufficient

Two Ton "Lightweight"—Weight 60 lbs.
Five Ton "General Utility"—Wt. 110 lbs.
Fifteen Ton "Special"—Weight 680 lbs.

Positive internal brake—Two quickly shifted speeds — Adjustable length crank handle — anti-friction babbitt bearings—Spring operated safety dog. Only eight parts. No keys or set screws to strip. Drum instantly free spooled for running out cable.

Complete descriptive literature and list of dealers in principal U. S. and foreign cities gladly mailed. Warehouse stocks for dealers supply—Seattle. Chicago. Brooklyn. Houston.

BEEBE BROS.
2728 6th Ave. S. Seattle 4, Wash.

OFFICIAL
U. S. FOREST SERVICE
FIELD CLOTHING

- Specified Fabrics
- Expert Tailoring
- Perfect Detailing
- Guaranteed Fit

Write for latest prices and sample fabrics.

THE FECHHEIMER BROS. CO.
Uniforms for Over 50 Years
CINCINNATI 2 OHIO

INGERSOLL SHOVELS
Blade Edges Guaranteed SPLIT-PROOF!

Shovels, Spades and Scoops of TEM-CROSS Steel (Interlocking mesh-grain structure) are light, strong, and hold edge unusually well.
INGERSOLL STEEL & DISC DIVISION
Borg-Warner Corporation, New Castle, Indiana

Duck Hunting vs. Duck Shooting

(*From page* 483)

but the locale of the picture will fit several well-known ducking regions during the years before the use of bait and live decoys was outlawed by the Federal regulations. Of course, it's a big club, which, by the way, must be credited with the careful preservation of a large area of marshland valuable to ducks at a time when the mania for draining every little mud puddle was sweeping the country.

It is a crisp fall morning and our members have had a leisurely breakfast prepared by a professional chef, served by a well-trained steward, and are ready to start out. Their guns have been put together by their "pushers" and lunch, thermos bottles, shell boxes, and other impedimenta have been placed in the boats, which are tied in a long string behind a cabin launch. Each boat has a crate of a dozen or so live "callers" on its bow. The flotilla starts out, the members gathered in the cabin of the launch, until the point is reached where each one boards his own boat and is dropped off for the particular blind that has fallen to his lot in the drawing.

Arriving at the well-built blind the member steps ashore while the pusher strategically "anchors out" the callers. Close to the blind is a pen of poultry wire fifty or sixty feet across, confining thirty or forty other live decoys. These birds have been here since before the opening of the season. They are, in fact, sort of a permanent feature of the landscape while the shooting season is on. Shelled corn is everywhere. Literally bushels of it, with big piles of ear corn on the bank, while the ground is covered with cobs.

As we arrive, a cloud of ducks, mostly mallards, rises with a roar of wings, and we barely get our "callers" out before they start to return, in singles, pairs, and small flocks. The sight of the flying birds seems to excite the "callers," which start up a great quacking. That, with the abundant supply of corn, is irresistible and the birds come in as though drawn by a magnet. The man in the blind has to know one thing—what will happen when he pulls the trigger of his gun. The birds do just about all the rest. The pusher keeps count and calls halt when the limit is down. Then the pick-up and back to the clubhouse for bridge or poker for the rest of the day.

That is *duck shooting*, but—is it *duck hunting?* As a meat getting proposition, it is almost unbeatable, but does it belong in the realm of sport? Under such conditions a limit could be killed with a sling-shot.

Of course, this picture doesn't portray all the wildfowlers or even a majority of them. In the first place, this kind of shooting takes real money and plenty of it! I have heard some club members say that their ducks cost them $25 to $50 apiece, and $10 ducks are common. Neither was the method peculiar to any one state. With variations of greater or lesser degree, the picture could have been set up in a dozen or more states from the Atlantic to the Pacific.

Neither should this be taken as an indictment of the club members. I know a lot of them, and they are a mighty fine bunch of men. They have treated me royally on more than one occasion and I count many of them as warm personal

NOMINATE YOUR FRIENDS FOR MEMBERSHIP

CLASSES OF MEMBERSHIP

Subscribing Membership	$4
Contributing Membership	10
Sustaining Membership	25
Life Membership	100
Patron Membership	1,000

Canadian Postage 25c extra, Foreign 50c extra, on Subscribing Memberships.

AMERICAN FORESTS Magazine is Sent Monthly to Members.

Date .....

The AMERICAN FORESTRY ASSOCIATION,
919 17th Street N. W., WASHINGTON 6, D. C.:

I nominate for membership in The American Forestry Association:

Name .....
Street .....
City and State .....
Business or Profession .....

Name .....
Street .....
City and State .....
Business or Profession .....

Nominated by .....

friends. It is the system or method that has grown up and which has become so difficult to dislodge. Its backdrop is a situation that prevailed only a generation or two ago. By 1900 our western frontier had vanished and with it the vast herds of bison. It was the day of the open range but the ecological conditions of the Great Plains had not been unduly disturbed. Little thought was then given to the drainage of the lakes, sloughs, and marshes that teemed with untold thousands of ducks, geese, and other birds. There is no reliable estimate of the continental population of waterfowl at that period, but the consensus of those whose experience lends weight to their opinions is that there must have been somewhere between 160,000,000 and 200,000,000 birds. Sport shooting was popular; seasons—where they existed at all—were long; and the market hunter was in his heyday.

While their take was large, the total number of gunners was but a fraction of those who today carry scattergun artillery to the duck blinds. Makeshift decoys were sometimes used but the idea that duck shooting could be simplified by covering the area about the blind with corn, or some other grain, was not yet born.

Then—on the general assumption that the bottoms of shallow lakes, sloughs, and marshes are always fertile—the craze for drainage swept the country. By 1922, approximately 75,000,000 acres were included in organized drainage districts—an area larger than that of the Great Lakes, or half again as large as all New England. Coincident with this destruction of waterfowl habitat was a rapidly growing interest in the sport of wildfowling aided and abetted by American ingenuity in the production of improved guns and ammunition, and the building of automobiles and paved roads that brought even the most isolated marsh areas within easy reach of the city sportsman.

With the continued decrease in the ducking grounds and the constant increase in the number of those who sought to use them, came keen competition among the gunners, each striving to make his particular area more attractive to the birds. The result was bait and more bait, live decoys and more live decoys, until in some important waterfowl sections, the preseason activities took on the appearance of large scale poultry production. Is it small wonder that our population of ducks and geese had dwindled to a scant 27,000,000 by 1934?

Also, it should be pointed out that in combination with bait and live decoys there is one thing even worse—the so-called "commercial club." The ethics of

The sailor with only 2 sweethearts

1. **MY FRIEND FRANK,** bosun's mate first class, pulled the snapshot out of his wallet. "Here she is," he said, beaming: "Eileen." "Nice!" I said. Then I noticed he'd dropped a scrap of paper. "Oh, that's my only *other* sweetheart," he said. "Look." It was a picture of a *shotgun!*

2. **"I FELL IN LOVE** with that shotgun when the Navy issued me one for skeet shooting back in anti-aircraft training," Frank went on. "Sweetest-handling autoloader I've ever come across. It's the Remington Sportsman—and believe me I'm gonna get one after the war. And then . . .

3. **"IF IT'S ALL RIGHT** with Eileen—for we'll be married then, I hope—I'm going to fill my pockets with Remington Express shells (you know, those long-range loads), and keep a date on a duck marsh with this second sweetheart of mine. Yes, and . . .

4. **"AS FOR QUAIL,** I know the place to find the fattest ones that ever sat in a roasting pan! You use Remington Shur Shot shells for those, of course." "Look, Frank," I said as an idea hit me like a 500-pound demolition bomb. "*I* gotta girl I hope I'm gonna marry, too. Sometime after this war job is done, what say we get the girls together and let 'em let their hair down for a few days—while we go hunting?" "*Sold!*" said Frank.

▶ Remington has produced vast military supplies—for months on end making, *per day*, 30,000,000 rounds of ammunition, and more than enough rifles to equip an entire infantry regiment! And soon—we hope—we will once more be able to furnish sportsmen with Remington shotguns and rifles, Remington Express and Shur Shot shells, Remington Hi-Speed .22's with Kleanbore priming, and Remington big game cartridges with Core-Lokt bullets. *Remington Arms Company, Inc., Bridgeport, Conn.*

Remington

DU PONT

NEW! Looking toward the day when we can supply essential civilian ammunition, we've designed new, easier-to-recognize packages for two of your old Remington friends.

If it's Remington It's Right

Sportsman, Express, Shur Shot, Hi-Speed and Kleanbore are Reg. U. S. Pat. Off. Core-Lokt is a trade mark of Remington Arms Co., Inc.

AERIAL PHOTOGRAPHY TOPOGRAPHIC SURVEYS

We suggest the *Aerial Survey* as a means of obtaining—quickly and economically—

(1) A Planimetric or Topographic Map
(2) Basic Land-Use Data
(3) Inventory and Natural Resources

Inquiries Invited

STANDARD AERIAL SURVEYS, INC.
PHOTOGRAMMETRIC ENGINEERS
418-426 CENTRAL AVENUE
NEWARK 7, N. J.

HANDBOOK *of* TREES Photodescriptive. Covers all the trees east of the Rockies and north of the Gulf States. 700 illustrations, 191 maps. Buckram, $6.

ROMEYN B. HOUGH CO.
LOWVILLE, N. Y.

SIGNED ORIGINAL PHOTOS

Unusual waterfall scenes from the southeastern forests. Velvet finish, on 11x8½" deckle edge mats suitable for framing. Ideal for home decoration or as gifts of distinction. Order singly, in pairs or sets of four. $1.25 each, plus .15 postage.

THE D. F. HAYDEN PHOTOS
551 Orme Circle N. E., Atlanta, Ga.

FIALA Patented **SLEEPING BAG**

WARM AS THREE BLANKETS
WEIGHT AND BULK OF ONE

Pure Long Staple Wool—No Shoddy or Cotton

FIALA—10 Warren St., New York 7, N. Y.

TWO BOOKS
Published and Recommended By Your Association

KNOWING YOUR TREES
$2.50

This book on trees contains more than 100 important American Trees. Actual photographs of all trees, their leaf, bark, flower and fruit, along with descriptions of their range, habits, uses and identifying characteristics, make this one of the outstanding tree books of today. Size 12 x 8¾". 224 pages.

AMERICAN CONSERVATION
$2.50

This volume presents the story of America's natural resources in picture and in story. It emphasizes the part they have played in the development of the nation, the manner and consequences of their use, and the spread of the conservation movement from its beginning in the United States down to the present time. Size 12 x 8¾". 160 pages.

THE AMERICAN FORESTRY ASSOCIATION
919 SEVENTEENTH STREET, N. W.
WASHINGTON 6, D. C.

sportsmanship usually do not exist at such a place where the shooter pays a stipulated price for a day's shooting (or less) with the limit guaranteed. "Selling the birds on the wing" in this fashion is not actually illegal, but it is, nevertheless, little short of highway robbery, since those ducks belong to you and me just as much as to the man who collects ten bucks for letting you shoot over his heavily baited puddle.

"Limit bags" under the system became so much a fetish that to many wildfowlers any day afield that did not witness the filling of the bag to the legal number was considered a failure. The ability of the hunter had little to do with it and many gunners were each year added to the ranks whose very physical makeup precluded them from ever being hunters. But they could be shooters, and they were. At any rate, the game resources of no place on earth could long survive against the army of killers, and the inevitable result was apparent before the Great Drought brought home the truth to everyone willing to see.

With the outlawing of artificial methods, we should witness the passing of the duck shooter. To be sure, he will protest vigorously and loudly proclaim his conservationism in supplying great quantities of food needed by the birds, but one may wonder what the tens of millions of birds ate before he appeared on the scene. If they do need help in the way of food, let the state and the federal government furnish it on refuges, or let the hunters feed them at times other than the shooting season.

And by all means, let's reform some more of these "Jims" and get back to basic principles of duck *hunting* and be satisfied with a little less duck *shooting*.

Forester for Coal Producers

Leslie E. Sawyer, forester for the U. S. Soil Conservation Service at Milwaukee, has been appointed forester for the Indiana Coal Producers Association, to succeed H. C. Hyatt, who died earlier in the year.

Graduating in forestry from Michigan State College in 1924, Mr. Sawyer, prior to his association with the Soil Conservation Service in 1933, was associate professor of forestry at the University of Georgia, a member of the Florida State Forestry Department, and extension forester of Illinois.

As has been reported in AMERICAN FORESTS through several aritcles, the Indiana Coal Producers Association is engaged in an extensive program of reforesting the stripped coal lands of the mining companies forming the Association's membership.

THE FOREST RESOURCE APPRAISAL

FACT-FINDING SURVEY WILL DETERMINE WAR'S EFFECT ON FORESTS OF THE U. S.

TO PROVIDE A BASIS for informed postwar handling of one of the country's most important natural resources, The American Forestry Association has initiated a fact-finding survey to determine what effect the war is having upon the country's forests and forest lands and what will be their condition when the manifold problems of reconstruction are at hand.

The project is a broad cooperative undertaking in which all interested individuals and agencies are invited to join. Its overall objective is to have available at the war's end down-to-the-minute facts as to the forest situation, upon which public and industrial policies of forest conservation, management and land economy can be based.

Public-spirited citizens, industrialists and organizations alert to the need of forest conservation and development in postwar economy have made the survey possible by underwriting more than four-fifths of its estimated cost of $250,000. The Association is now engaged in raising the balance.

Let's make it a joint undertaking. We invite your help in this financing. Do it now with a cash contribution, a pledge, or, buy a Series F or G War Bond in the name of The American Forestry Association and mail it to us.

THE AMERICAN FORESTRY ASSOCIATION
919 17th Street, N. W.
Washington 6, D. C.

HASTEN THE DAY!

YOU can help hasten the day—THE day of final unconditional surrender—by investing your war-time earnings in War Bonds.

Hastening the day means shortening casualty lists. In war, bullets, shells and bombs are exchanged for lives. The War Bonds you buy help pay for the bullets, shells and bombs that will speed the victory.

Your consistent War Bond investments will work for you too at the same time that they work for your boy in service. They will give you that luxurious feeling of freedom that goes with a well-lined pocketbook. For whatever you may desire ten years from now, your War Bonds will add one-third more to what you've invested.

Help hasten the day of victory, and help make that victory more secure—buy your War Bonds today.

BUY WAR BONDS

AMERICAN FORESTS MAGAZINE

This is an official U.S. Treasury advertisement—prepared under auspices of Treasury Department and War Advertising Council

GROW XMAS TREES OR FOREST

Write Today for Special Christmas Tree Bulletin and Complete Forest Tree Price List

	Per 1,000
2 yr. Special American Red Pine	$12.00
3 yr. Austrian Pine	20.00
2 yr. Special Colorado Blue Spruce	10.00
4 yr. Norway Spruce	40.00
2 yr. Douglas Fir	12.00

MUSSER FORESTS, Inc.
Indiana, Penna.

CHESTNUT TREES

Buy Bearing Blight - Resistant Chinese Chestnuts

easily grown, heavy yielders, Northern Strains

NUTS IN FOUR YEARS!

Plant for Nuts—Profit—Shade—Beauty—Fun

Send postcard now for FREE booklet and prices on over 42 varieties of nut trees. Excellent for ornamental purposes. I have experimented with nut trees for over 48 years.

Sunny Ridge, 442 New St., Swarthmore, Pa.

TREES FOR SALE

FOR FOREST PLANTING

Norway Spruce, Red Pine, White Pine, Scotch Pine, White Spruce, Colorado Blue Spruce, etc. Prices are reasonable and the trees are GUARANTEED TO LIVE.

WESTERN MAINE FOREST NURSERY, DEPT. F.
Fryeburg, Maine

TREES FOR FOREST PLANTING

PINE•SPRUCE

Firs, Arborvitaes and Other Conifers. We raise all our trees in our own nurseries.

KEENE FORESTRY ASSOCIATES
KEENE, NEW HAMPSHIRE

Bartlett Tree Tools

are used the world over

Purchased on Priority

Send for Catalog and plan for the future

TRADE MARK COMPOUND

BARTLETT MFG. CO., 3019 E. Grand Blvd.
Detroit 2, Michigan

New WOOD BURNING STOVE
Automatic Heat Control

CUTS heating costs . . . burns any kind of wood successfully. New principle of complete combustion greatly increases efficiency—reduces creosote. Large fuel magazine . . . holds even temperature for 12 hours. If your fuel is rationed this Heater will solve your problem. Ask for Folder R.

Cabinet and Radiant Models

RITEWAY PRODUCTS COMPANY
BOX 6-A HARRISONBURG, VIRGINIA

Check-List for Survival

(*From page 478*)

trouble to yourself. All the fish along the shores of the North Pacific, clear up to the Arctic Ocean, are good to eat. In addition, the locale provides birds, mammals, drinking water and many edible plants. No equipment is necessary to last out when you're beached, but survival becomes a hundred-fold easier if you have matches, a head net and a machete. See that you don't wash up without them!"

Soldiers on land are told: "If you get lost, sit down, think the situation through and don't be in a hurry to do anything. You can still keep on living. You'll need the same things as all the other lost men in the world—food, water, shelter, rest and sleep. You'll tire just as quickly from lack of sleep as you will from lack of food. Make camp with the least possible expenditure of energy and *start early!* The time you spend making yourself comfortable at night will pay dividends the next day."

If a man is hung up in a jungle and thinks he should climb a tree to get his bearings, he is warned not to shinny up a tree so big he can't reach around it, or so high he'll become exhausted before reaching the first branch. He is told to test all limbs before putting his entire weight on them—that dead limbs are untrustworthy, that *any* limb is strongest near the trunk. Nor should he attempt to climb a wet tree.

The sun by day and the stars at night are traditional guides for maintaining a course—but on the ground the stranded soldier is encouraged to take a look at the landscape. Drainage patterns, the trend of ridges or mountains, the kind of vegetation in the areas are all clues. If he is on the march, it is suggested that he choose a prominent landmark in the direction of travel. In dense forests he can hold a course by lining up three trees. On cloudy days he should mark his trail with blazes and bend bushes so that the under and lighter side of leaves are turned uppermost.

A man traveling in jungle brush or dense woods should move in one direction, but should not bother about a straight line. He should turn shoulders, shift hips, bend his body, slow or speed his pace as the situation requires. He should watch his surroundings generally and the ground in front of him closely. If he is in enemy territory, he should stop and remain motionless now and then. This will enable him not only to see an enemy, but to check his bearings.

The easiest way to follow the course of a stream is to use it as a highway. That calls for a canoe, dugout, or raft. If a native can be persuaded to part with one, the lost trooper is told to remember that any seagoing tree has ideas about its own center of gravity. He should keep his weight low; keep amidships on one knee and paddle in that position. If he turns over, he should stay with the craft. If he has to pole, the correct position is to stand amidships facing one side.

If he can't find a canoe or dugout, logs bound together will serve as a raft for crossing or navigating a stream. But he is warned to be sure of his trees. Imagine the feeling of the airman who picked a big thicket of trees, worked for days to cut them down, only to find that the wood he chose for a raft wouldn't float. Many tropical trees will sink even when the wood is dead. Stranded drift logs, lashed together with bark, or bundles of bamboo bound together with vines and lashed to cross pieces make excellent rafts. Palms do not float well.

Thirsty? The stranded man has only to try any grapevine. This is cut as high as he can reach, the severed end kept elevated. Then the vine is cut off close to the ground. This should give him a water tube six to seven feet high. When water stops dripping from the lower end, he cuts another section off the top and more water will drain out. If the bottom of the vine is cut first, part or all of the water will be lost as it will ascend. It is not necessary to purify water from a vine.

Sap is chiefly water and in many plants is fit to drink—may save a man's life in an emergency. Fruits, growing tips, leaves, stems and buds of many plants contain small quantities of water.

Drainable, sugary sap can be obtained from many palms. To start coconut sap flowing, the flower stalk is bent downward and the top cut off. The flow can be renewed every twelve to twenty-four hours by cutting off another slice. On many coconut palms the nuts are generally in varying stages of maturity; and strange as it may seem, green nuts are best. They are more easily opened, have more fluid, and the fluid can be taken in quantity without harmful effect. The juice of the ripened coconut will act as a violent physic if more than three or four cups are taken daily.

Many plants catch and store rain water, the survival manuals reveal. The traveler's tree of Madagascar and Reunion has a cup-like sheath at the base of its leaves in which quantities of drinking water collect. Water can be obtained from the umbrella tree of western Tropical Africa. The bottle-like trunk of the *babbab* tree of northern Australia and Africa in the wet seasons collects water which stays fresh and clear through

weeks of dry weather. Air plants which affix themselves to jungle trees are good reservoirs. Leaves of the pineapple-like *bromelias*, in particular, form regular basins which may catch and hold several pints of rain water. To clear muddy water, the men are told to fill a length of bamboo with sand and clog it with grass or clothing to keep the sand in. Then let the water pass through it.

There is a world-wide pattern in water distribution if stranded men haven't swinging vines to supply them. They dig for it! The level of the water table tends to follow the contour of the land surface, rising somewhat beneath hills and, in some places, intersecting the surface to form springs or seepage areas or to merge with streams, swamps and lakes. It is usually close to the surface and can be used with little digging in low, forested areas, along the seashores and in the flood plains of large rivers.

Converging game trails, flight of birds, presence of certain plants point the way to water along the seashore, in low basins where the drainage from the land is concentrated, or in desert or arid lands where palms indicate surface water.

Fire-making keeps a stranded man warm, cooks his food, destroys harmful germs found in food and water. Needless to say, no one who may have to shift for himself in a remote area should be without matches carried in a waterproof case. The best cooking is done over a bed of glowing coals, not flames. A small fire is better than a large one, for nearly all purposes. A very small fire will warm a man thoroughly if he will sit or kneel over it, draping a coat, blanket, or parachute so as to direct all the heat upward. The base of a tree, rock, or log can be a heat reflector. Heat also can be reflected by snow, boughs, or sod. Men are taught to lie between the fire and a reflector to keep warm while they sleep.

Of course all three branches of our fighting forces carry on the business of rounding up the lost, beached and stranded, and the survival percentage is impressive. The things the rescued men have contrived to feed and shelter them are carefully noted; their dangerous experiences, their thoughts and their conclusions are of record, often incorporated in survival courses. However, for security reasons, names of islands, beaches, jungles, or desert terrain are usually withheld from publication. So bitter is the determination of the Pacific Island enemy to blot out the white man that if an Army flier, Navy man, or marine is found and relates his being alive to the trees, plants and animal life of the terrain, enemy bands tear up, dig up and crop out everything that might contribute to the survival of a subse-

(*Turn to page* 511)

SOMETHING TO SHOOT AT

Many of the targets used in teaching service men how to shoot are cardboard cut-outs, which are die-cut on cylinder presses. The die is made of steel rule which cuts against a hardened, tempered and ground steel sheet known as cylinder jacket or tympan. These steel jackets are made in various sizes up to 56" x 80" in thicknesses from .062 to .135 of an inch. And the sheets must be curved to fit the cylinder without producing high or low spots on the jacket.

To make cylinder jackets that meet these strict requirements demands a rare knowledge of steel, a high degree of skill and experience and some pretty smart engineering. To the best of our knowledge, no one except Disston makes these hardened, tempered and ground cylinder jackets.

Chances are you have no use for cylinder jackets. But here's the point: you can use the Disston skill with steel and the Disston engineering experience, which make it possible for Disston to do the most difficult jobs. These assets are yours in our standard tools . . . in Disston circular and band saws . . . in our files and hack saw blades . . . in dozens of industrial tools for cutting wood, metals and other materials.

Above illustration shows how Disston steel cylinder jacket, or tympan, is used on cylinder type of printing press. The die, made of Disston steel rule, is locked in position on bed of press. Cardboard to be cut is fed into press just as in printing. As the cylinder revolves, cardboard is die-cut when it passes over the cutting die—the steel rule being forced into and through the cardboard against the steel jacket.

How may we help YOU? Write to Henry Disston & Sons, Inc., 1094 Tacony, Philadelphia 35, Pa., U. S. A.

DISSTON

Conserve Man-Minutes and help win the war

CROSSING AND RE-CROSSING THE CONNECTICUT RIVER—A Description of the River from its Mouth to its Source, with a History of its Ferries and Bridges, by Charles W. Whittlesey. The Tuttle, Morehouse and Taylor Company, New Haven, Connecticut. 143 pages, illustrated, bibliography. Price $1.25.

This is the story of one of the great rivers of America written in the novel terms of the bridges and ferries that cross it. When we say great we do not mean in volume of water for there are many other rivers that carry more water but have less historic, scenic or even economic importance.

Mr. Whittlesey was long treasurer of the Connecticut Forest and Park Association and even longer an active worker in the Society for the Protection of New Hampshire Forests. He knows his river from source to mouth. His history concerns the log driving on its upper course, lumber rafts on its middle reaches and wooden ship building on its tidewaters, as well as its bridges, many of which are of importance in engineering history.

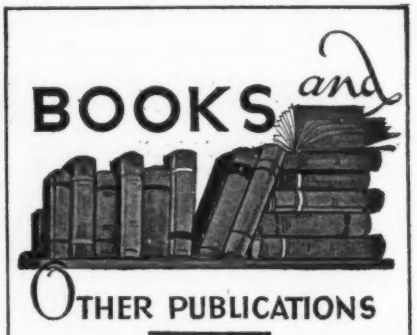
Both antiquarians and timber engineers will thrill to know that wooden covered bridges are still being constructed over the Connecticut River by the New Hampshire Highway Department.

TREES, by Samuel Rawlins Stevens. Published by Cecil Baugh & Co., Dallas, Texas. 201 pages, illustrated. Price $3.00.

Approaching the subject of trees with an appreciation of their spiritual as well as material significance, the work of the author, dating over a period of twenty-five years, culminated in a book of unusual beauty and value. Starting with the origin of the life of trees, their growth and distribution, his subjects range through the uses of wood,—the history of lumbering, with an interesting record of the "sawmill sign language"; forest fires and reforestation and soil erosion, and the record of some of the most famous individual trees in American history.

DECIDUOUS ORCHARDS, by William Henry Chandler. Published by Lee & Febiger, Washington Square, Philadelphia, Pa. 438 pages, illustrated. Price $4.50.

A complete and orderly presentation for the use of the serious student of the science of pomology—of deciduous orchard fruits and their production. The author includes helpful information in solving orchard problems and an exposition of tree processes, responses and relationships.



A list of Selected Books on Forestry and related fields of Conservation is available to members of The American Forestry Association on request.

TREES AND TEST TUBES—The Story of Rubber, by Charles Morrow Wilson. Published by Henry Holt & Co., New York, N. Y. 325 pages, illustrated. Price $3.50.

The story of rubber, always romantic and full of interest—today has assumed a grim importance. For mechanized equipment moves on rubber and, in this war, mechanized equipment *is* moving—under terrific stress—on every battle-front. The author recounts the saga of rubber—the jungle epic of the Amazon, the story of the rise of the great rubber agriculture of the British and Dutch in the East, and the story of the synthetics and cryptostegia. Appended is a digest, together with the full report, of the Baruch committee.

NATURAL HISTORY WITH A CAMERA, by L. W. Brownell. Published by the American Photographic Publishing Company, Boston, Mass. 292 pages, illustrated. Price $3.75.

Opening with a complete description of equipment and materials necessary for nature photography, and valuable instruction as to subject approach, this book proceeds with a month to month discussion of field studies, beginning with nature's own calendar in the month of March, when earth stirs and awakens from her long sleep. The gifted author tells about the ways of the wildlings, where and when to look for them and how to handle them when found—but points out that this knowledge may best be acquired through individual experience. His own meaningful, beautiful photographs illumine the text, as nature's year rolls along towards February, and the book ends—full of interest to the last line.

The publications listed below must be ordered direct from the addresses as given and not through the Association.

Decay in Balsam Fir in New England and New York, by Perley Spaulding and J. R. Hansbrough. Forest Service, U.S.D.A., Tech. Bull. No. 872. Supt. of Docs., Wash., D. C. Price 10 cents.

The Commercial Timbers of Mexico—a compilation from various authorities. Published by Arnold Joerns, 333 North Michigan Avenue, Chicago, Ill. 21 pages, price $1.00.

Quantity of Wood Treated and Preservatives Used in the United States in 1942, by R. K. Helphenstine—a statistical report on the industry. U. S. Forest Service, Washington, D. C.

A Practical Forest Farm, by Colin G. Spencer. Published by Mr. Spencer at Carthage, N. C.

Wisconsin's Deer Problem—Compiled by Aldo Leopold. Pub. 321, Wisconsin Conservation Department, Madison, Wis.

The Control of River Silting, by Carl B. Brown. Soil Cons. Serv., U.S.D.A., Misc. Pub. No. 521, Supt. of Docs., Wash., D. C. Price 25 cents.

Control of Mesquite on Southwestern Ranges, by Kenneth W. Parker. Forest Service, U.S.D.A., Leaflet No. 234. Supt. of Docs., Wash., D. C.

Management of Georgia's Woodlands, by A. E. Patterson and D. J. Weddell. Bull. 1, George Foster Peabody School of Forestry, Univ. of Georgia, Athens, Ga.

Deterioration of Fire-Killed Douglasfir, by J. W. Kimmey and R. L. Furniss. Tech. Bull. No. 851, U.S.D.A. Supt. of Docs., Wash., D. C. Price 15 cents.

Investigations in Erosion Control and Reclamation of Eroded Land at Blackland, by H. O. Hill, W. J. Peevy, A. G. McCall and F. G. Bell. Tech. Bull. No. 859, Soil Conservation Serv., U.S.D.A. Supt. of Docs., Wash., D. C. Price 20 cents.

Sagebrush Burning—Good and Bad, by Joseph F. Pechanec and George Stewart. Farmers' Bull. No. 1948, U.S.D.A. Supt. of Docs., Wash., D. C. Price 10 cents.

The Junior Tree Warden. For the Schools of New South Wales. Alfred Henry Pettifer, Acting Govt. Printer, Sydney, Australia.

CORRECTION

In the September number, page 452, in announcing the book—"Seneca Indians—Home Life and Culture"—the address of the publisher was erroneously given as "The Conservation Society of York County, N. Y.," whereas it should have been "The Conservation Society of York County, Pennsylvania."

Check List for Survival

(*From page* 509)

quent involuntary visitor. The stranded have tall tales to tell, but the ABC's of survival as spelled out by them on land and sea are about the same.

"Birds and animals were easily seen, but actually they weren't nearly as plentiful or easy to catch as other victuals. I went after fish, and mollusks, insects and even snakes, first. When I got over feeling starved, I watched for bigger game. Birds and mammals are creatures of habit, the book says. Mice, ground squirrels and rabbits travel old trails—so I found some trails and hunted and trapped along there with roots soaked and twisted and inner bark of trees for nets and nooses. A country that seemed to have no life in the daytime seemed to 'come alive' at night. I got enough meat to keep me going."

Another reports: "In the tropics keeping yourself and your equipment dry is a major problem—but you have plenty of material to work with in the forests and jungles. A good waterproof fabric can be made from the broad leaves of a young banana tree. Build a hot fire on a flat stone or a platform of small stones. Then rake the coals off and place the banana leaves on the hot stones one at a time. Let the leaf remain a moment or two until it turns dark and becomes glossy. The heat sort of rubberizes the leaf, making it pliant and water-repellant. They'll last for some time."

Men who are forced to make it alone in the Arctic, the desert, the jungle, or on the ocean can eventually get back. The natural instinct of self-preservation plus common sense, imagination and ingenuity can beat any terrain or climate.

The Woods I Knew

(*From page* 491)

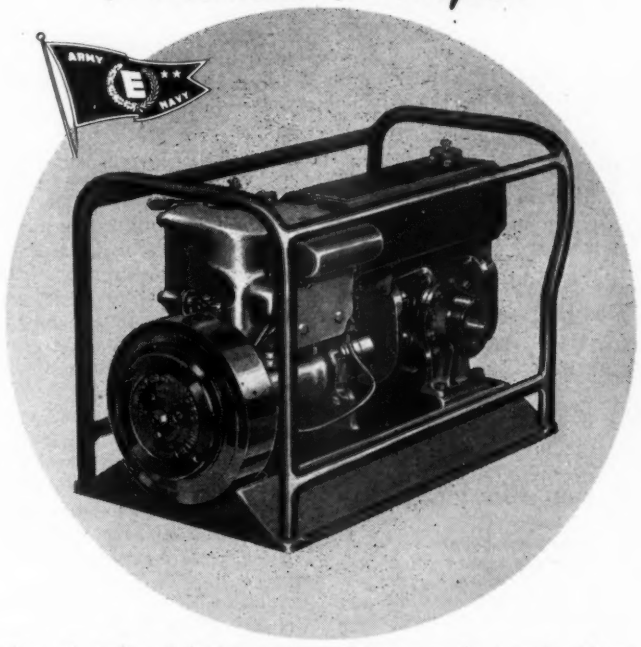
signalled each other in hoarse, throaty moans. But let the North Wind awake! Then the soughing boughs of spruce trees on the northern side of the house waved forebodingly and, with every recurring gusty blast, presaged the coming of snow.

Today such sounds are unheard by the dweller beneath my roof. Long ago those giant trees succumbed to more practical demands. Even hoarse exhortations from distant river traffic are stilled, or muffled, owing to the interposition of tall buildings between me and that maritime realm. Only the prosaic disturbance of automobile traffic shuttles back and forth before my door. Thus the quiet beneficent surroundings of the natural world become more difficult of attainment by increasing numbers of men, as we become engulfed in the alien environment of our great cities.

Pacific

HANDY BILLY

Portable Pumper



The principles of design and precision manufacture that have made the Pacific Handy Billy such an effective fire fighter for the Navy will, in due course, be available to protect forestry, industry and shipping against the ravages of fire.

Fire Fighting Equipment Division

PACIFIC MARINE SUPPLY COMPANY

SEATTLE, WASHINGTON

SANDVIK BOW SAWS

MAKE HARD WORK EASY!

SANDVIK BOW SAWS lead in quality and performance, are always dependable and materially assist in reducing operating costs. FRAMES of lightweight Steel Tubing, SAWS made from best procurable saw Steel, thin back, fast and easy cutting.

Send for Descriptive Folder

Sandvik Saw & Tool Corporation

47 WARREN ST. NEW YORK (7), N. Y.

THE AMERICAN WILDLIFE INSTITUTE PRESENTS

THE WOLVES OF NORTH AMERICA

Stanley P. Young and E. A. Goldman

660 Pages, 137 Halftones
6 Full-color Plates, 10 Maps

FIRST EDITION 1944
BUCKRAM - - - $6.00

Universal in its appeal, this is a book of enjoyment, information and knowledge for SPORTSMEN, RANCHERS, FARMERS, HISTORIANS, NATURALISTS, ARTISTS, STUDENTS OF AMERICANA, TEACHERS, DOG-LOVERS, and others.

Written at a time when only remnants of the species survive, and when men who have lived with them and know them are scarce, the book *(the only one of its kind ever published)* is destined to be a classic. Reviewers have recommended its inclusion in every school, public and personal library.

A BOOK WITHOUT PARALLEL
A GIFT WITHOUT COMPARISON

THE AMERICAN WILDLIFE INSTITUTE
822 Investment Building
Washington 5, D. C.

Enclosed $..... for which mail to the address below ..... copies, *Wolves of North America.*

Name.....

Street.....

City and State.....

3 Patents. Best material.

Infringers and imitators warned.

Best High Carbon Steel—Strong, Durable.

THE RENOWNED

Rich Forest Fire Fighting Tool

Any quantity sold up to the thousands. Write for Prices and Description

C. H. RICH WOOLRICH, PA.

The Government buys by the thousand.

Postwar Conservation

(*From page* 480)

oping the Columbia Drainage Basin for their mutual benefit.

"One of BPA's principal tasks will be to integrate the power systems of that region, both present and prospective, so as to diffuse to best advantage the 2,600,000 kilowatts of electric energy now being produced at Bonneville and Grand Coulee, as well as an additional 1,500,000 kilowatts that could be generated as an adjunct to the $600,000,000 development program envisaged by the five-state association in cooperation with the federal government.

"For its part, BPA's plans call for an expenditure of about $100,000,000, principally on construction of transmission lines and power substations, plus surveys of power utilization possibilities by private manufacturing users, irrigation pumping stations, municipalities and others. Its program is expected, within the foreseeable future, to provide approximately 35,000 man-years of employment on construction and fabrication of materials.

"A better balanced economy for the Pacific Northwest is believed to be possible as a result of this proposed postwar development. If a great variety of industries with major dependence upon cheap electricity can be induced to that region, it is believed by many experts that within the next twenty years the Pacific Northwest can easily support an increased population of at least 2,000,000.

"To translate the Department's program into reality will cost money, perhaps as much as three and three-quarters billions of dollars. That seemingly vast sum is, however, only about as much as it costs to carry on the war for a fortnight."

CREDIT FOR PHOTOGRAPHS

Credit for photographs appearing in this issue is acknowledged as follows:

American Forest Products Industries, Inc., pages 484 and 485.
Baker, Bernard W., page 481.
Craighead, Frank and John—pages 476, 477 (at foot of page) and 478.
Fair, Paul J.—the front cover.
Harris & Ewing—page 494.
Lincoln, Frederick C., pages 482 (top) and 483 (lower).
National Park Service—pages 472 (lower), 474 and 475 (upper).
Photo—Art Commercial Studio of Portland, Oregon—page 470.
Public Roads Administration—page 475 (lower).
Shannon, Howard J., pages 489, 490 and 491.
Trenk, Fred—pages 492 and 493.
U. S. Army, Air Corps—pages 476 and 477 (upper).
U. S. Fish and Wildlife Service—pages 482 (center and lower) and 483 (top).
U. S. Forest Service—pages 486, 487 and 488.

WHO'S WHO

Among the Authors in this Issue

Victor H. Cahalane

VICTOR H. CAHALANE (*Buffalo, Wild or Tame?*), writer and wildlife specialist, is a Massachusetts State and Yale forester. Entering the National Park Service in 1934, in 1936 — as biologist —he was placed in charge of their wildlife program, acting as technical advisor on grazing, fish culture and wildlife management problems. Mr. Cahalane has written for the *Saturday Evening Post*, the *National Geographic Magazine*, and other national publications, and his book, *Meeting the Mammals*, was published by Macmillan in 1943.

FREDERICK C. LINCOLN (*Duck Hunting vs. Duck Shooting*) is in charge of Migratory Bird Investigations for the United States Fish and Wildlife Service. Frequently called the "director of bird-banding in America," Mr. Lincoln joined the Biological Survey in 1920. He has conducted ornithological expeditions in several states and was a member of the Smithsonian Scientific Expeditions to Haiti and the Dominican Republic back in the '30's. His book, *The Migration of American Birds*, came out in 1939, and his work now for the government is largely in connection with studies of migratory American birds and their distribution.

REGINALD D. FORBES (*The Anthracite Region Discovers Its "Surface"—Part II*), consultant forester, writing from Ambler, Pennsylvania, concludes his article started in the September issue. A Yale forester, Mr. Forbes for twenty years directed the work of federal forest experiment stations in the South and the Allegheny area.

HOWARD J. SHANNON (*The Woods I Knew*) has devoted many years to the study of natural history, especially on Long Island, and has written widely in this field for national publication. Mr. Shannon is prominently identified with scientific organizations and the Authors' League.

FRED TRENK (*Specialty Forest*) is a farm forestry specialist and writes from Madison, Wisconsin. For six years he was extension forester for Maryland and is now rounding out twenty years of service in that field, having spent the last fourteen in the service of the State of Wisconsin.

ONE AVENUE FOR FIRE CONTROL

PROTECT that forest against fires — an important and essential job here on the home front. Many avenues open to provide better-managed forests. Galion motor graders provide one in helping to keep fire breaks open, thereby reducing fire loss to our national resources. Investigate Galion Motor Graders.

The GALION IRON WORKS & MFG. CO.

Main Office and Works: Galion, Ohio

You can depend on INDIAN

FIRE PUMPS

They are the Big Name in Fire Fighting!

Equipment which passes the tests of the Army has to be right. Hundreds of *INDIAN FIRE PUMPS* are used regularly by the armed forces to stop fires on rifle and artillery ranges and fires in barracks, tents, warehouses, hospitals and other frame buildings. An *INDIAN FIRE PUMP*, using only clear water, will get you out of many a "hot spot." Be sure you have plenty of these great fire fighters—the cost is low. Catalog gives prices and full information. Send for a copy.—***Write us today!***

D. B. SMITH & CO.

405 MAIN ST., UTICA 2, N. Y.

PACIFIC COAST BRANCHES:

HERCULES EQUIPMENT & RUBBER CO.,
435 Brannan St., San Francisco, Cal.

ROY G. DAVIS CO.
617 E. Third St.,
Los Angeles 13, Cal.

CARCO-CONWHIT CO.
520 SW Pine St.,
Portland 4, Oregon

THE CONWHIT CO.
Klamath Falls, Oregon

MILL & MINE SUPPLY CO., 2700 4th Ave., South, Seattle, Wash.

"THE BEST OUTFIT WE HAVE SEEN"

Camp Manufacturing Company

Kiln-Dried North Carolina Pine, Rough & Dressed

D. B. SMITH & CO., Inc.
Utica, New York
Gentlemen:

We use your INDIAN FIRE PUMPS very extensively in fighting fires in our various holdings. We have equipped our trucks with several INDIAN FIRE PUMPS and we unhesitatingly recommend them to any one to protect forests from fire.

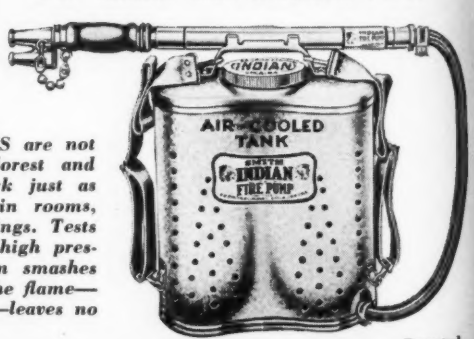
The INDIAN is the best outfit for this fire fighting work that we have seen. It is always ready and never fails. The fact that it uses only clear water is a big asset and the air-conditioned tank is another big help because it keeps a man's back dry and comfortable.

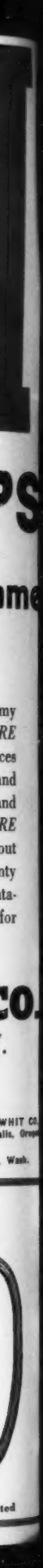
Each INDIAN FIRE PUMP is really a little fire department in itself for there are many kinds of fires that it completely takes care of.

Yours very truly,

CAMP MANUFACTURING COMPANY
By P. R. Camp
Vice-Pres. and Gen. Mgr.

For Inside and Outside Fires



***INDIAN FIRE PUMPS** are not limited to use on forest and grass fires—they work just as effectively on fires in rooms, buildings and furnishings. Tests have shown that the high pressure, powerful stream smashes right to the base of the flame—puts it out instantly—leaves no smouldering embers.*

Patented